The Proto-West-Coastal Bantu Velar Merger

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Abstract

In this article, we assess the genealogical validity of West-Coastal Bantu (WCB) as a major subclade of the Bantu family by means of the Comparative Method. Based on a comparative dataset of 66 different cognate series, we demonstrate that languages previously classified as WCB according to lexicon-based quantitative methods share at least one common phonological innovation: the phonemic merger of the Proto-Bantu velar stops ***g*** and ***k*** due to the devoicing of ***g*** when not preceded by a nasal. We show that the velar merger is a unique phonological innovation distinguishing WCB from other Bantu phylogenetic groups such as South-Western and Eastern. It probably also separates WCB from North-Western and Central-Western Bantu, where ***g*** did devoice, but not always before ***k*** became zero. However, at this stage, there is not enough empirical evidence and especially not sufficient systematic historical-comparative linguistic research to further test this hypothesis. In any event, building on Möhlig (1981), we speculate that the recurrent devoicing of ***g*** in several ancestral Bantu languages of the rainforest could be diagnostic of a pre-Bantu hunter-gatherer substrate.

Keywords: Proto-Bantu velar stops, phonemic merger, genealogical language classification, West-Coastal Bantu, Forest Bantu, Bantu Expansion, substrate influence.

Introduction

Ever since Vansina (1995), quantitative approaches to genealogical Bantu classification relying on basic vocabulary, both lexicostatical and phylogenetic, have pointed towards the existence of a major clade within the Bantu family called West-Coastal Bantu (WCB), a.k.a West-Western (Bastin *et al.* 1999; Bostoen *et al.* 2015; de Schryver *et al.* 2015; Grollemund *et al.* 2015; Bostoen & de Schryver 2018a, b). It comprises the languages from the groups coded B40-80, H10 and H30 in Guthrie's referential classification of the Bantu languages as well as Hungan H42 and Samba L12a (cf. Guthrie 1971; Maho 2009). Including more B50-80 varieties than any previous study, Pacchiarotti *et al.* (2019) present the most comprehensive genealogical classification of WCB. Their lexicon-based phylogeny has not only confirmed the genealogical unity of WCB, but has also led to a different understanding of the clade's internal diversity and, subsequently, to the establishment of a new homeland area. However, language phylogenies and the family tree model intimately linked with it are only one way of representing the evolution of languages, as basic vocabulary is only one type of linguistic evidence – the most commonly applied though – which can be used to infer such genealogies (cf. Nurse & Philippson 2003; Dunn 2014; François 2014; Philippson & Grollemund 2019). Ideally, historical linguistic insights from quantitative lexicon-based approaches should be tested against other kinds of data analyzed with different methods.

In this article, we assess the genealogical validity of WCB as a major subclade of the Bantu family through a diachronic phonological approach using the classical Comparative Method. Banking on a comparative dataset consisting of 66 different cognate series, presented in Appendix 1, we show that all languages previously classified as WCB share at least one common phonological innovation, i.e. the partial phonemic merger of the Proto-Bantu (PB) velar stops ***g*** and ***k*** due to the devoicing of ***g*** when not preceded by a nasal. According to the law of parsimony, this shared innovation must go back to at least the most recent common ancestor of WCB. Hence, it possibly confirms the genealogical unity of WCB as a discrete clade within the Bantu family. This can only be the case when the most recent common ancestor of other major clades did not undergo the same innovation. We therefore also consider comparative evidence for the merger of PB velar stops from other major Bantu clades.

Examining the velar merger outside of WCB is needed, because the PB ***g*** > ***k*** shift is known to be widespread in the northwestern part of the Bantu domain (Guthrie 1967: 62,75; Möhlig 1981: 299; Nurse & Philippson 2003: 177). Nevertheless, it is not well-known when and where this led to a merger with the reflex of PB ***k***. Nurse and Philippson (2003: 177) consider ***g*** > ***k*** as one of the three innovations that would be diagnostic of a large Bantu subgroup which they call "Forest Bantu" comprising Guthrie's zones "A, B, C, large parts of H, and most (how much?) of D10-20-30". However, Nurse and Philippson (2003: 177) refrain from: (i) specifying the phonotactic position in which the merger occurred, i.e. first root consonant (C1), second root consonant (C2) or both, even when position is important because phonological neutralization is known to occur across languages more commonly at the end of words than at the beginning (cf. Wedel *et al.* 2019 and references therein); (ii) examining ***g*** > ***k*** consistently in conjunction with the

evolution of PB ***k***, which greatly downgrades the genealogical diagnosticity of this innovation; and (iii) providing evidence for the existence of this sound change, but mostly rely on the comparative phonological data in Guthrie (1971), which often do not stand the test of reliability when compared to other published sources on specific Bantu languages. We therefore peruse the available literature specifically dealing with the diachronic phonology of northwestern Bantu languages (mostly Guthrie's zones A, B, and C).

As we show in this paper, it is often hard to tell at this stage whether the velar merger occurred both in C1 and C2 positions in northwestern Bantu languages other than WCB, because the great majority of available sources do not offer a systematic examination of the evolutions of PB consonants in the relevant subgroups. At the same time, the available literature on the evolution of PB velars in specific subgroups does not provide conclusive evidence against the existence of a velar merger either. If the systematic application of the Comparative Method would prove that the velar merger did indeed occur in the northwestern geographic area more generally, in the same way it did in WCB, this would posit a considerable problem for the lexicon-based phylogenetic tree of Grollemund *et al.* (2015) and previous ones supporting a 'late split' or 'east out of west' model of Bantu language dispersal (cf. Henrici 1973; Heine *et al.* 1977; Ehret 2001; Holden *et al.* 2005; Rexová *et al.* 2006). Therefore, the results presented in this article have potential implications not only for the history of WCB, but also for Bantu historical linguistics more generally.

This article is organized as follows. In §1, we briefly discuss the lexicon-based WCB phylogeny by Pacchiarotti *et al.* (2019) and present the data and methodology we used for this research. In §2, we present the three major types of reflexes of PB ***g*** and ***k*** in WCB, i.e. voiceless velar stop (§2.1), fricatives (§2.2) and zero (§2.3), and conclude that the merger of PB velar stops is a shared innovation which WCB languages inherited at least from their single most recent common ancestor (§2.4). We also show that the merger did not target PB ***g*** when it was preceded by a non-syllabic homorganic nasal (§2.5). In §3, we examine evidence concerning the merger of PB velar stops from the larger northwestern area around WCB (§3.2, §3.3) as well as to the south and to the east (§3.1). Discussion and conclusions are in §4. After references, there are two appendices. The first provides 66 WCB cognate sets as evidence for the claims made in §2 and subsections therein. The second is a list of language varieties included in this study and the sources we used to gather comparative evidence.

1. Data and methodology

Our sample consists of 41 varieties belonging to what is known as the West-Coastal Bantu (WCB) branch of the Bantu language family. WCB languages span across Gabon, the Republic of the Congo, the Democratic Republic of the Congo (DRC) and northern Angola. Major WCB subgroups according to the most recent lexicon-based phylogenetic classification are in Figure 1 (Pacchiarotti *et al.* 2019). For a detailed account of the internal structure of the Kikongo Language Cluster or KLC (B40, H10, H30, H42, L12a), see de Schryver *et al.* (2015) and Bostoen and de Schryver (2018a, b).

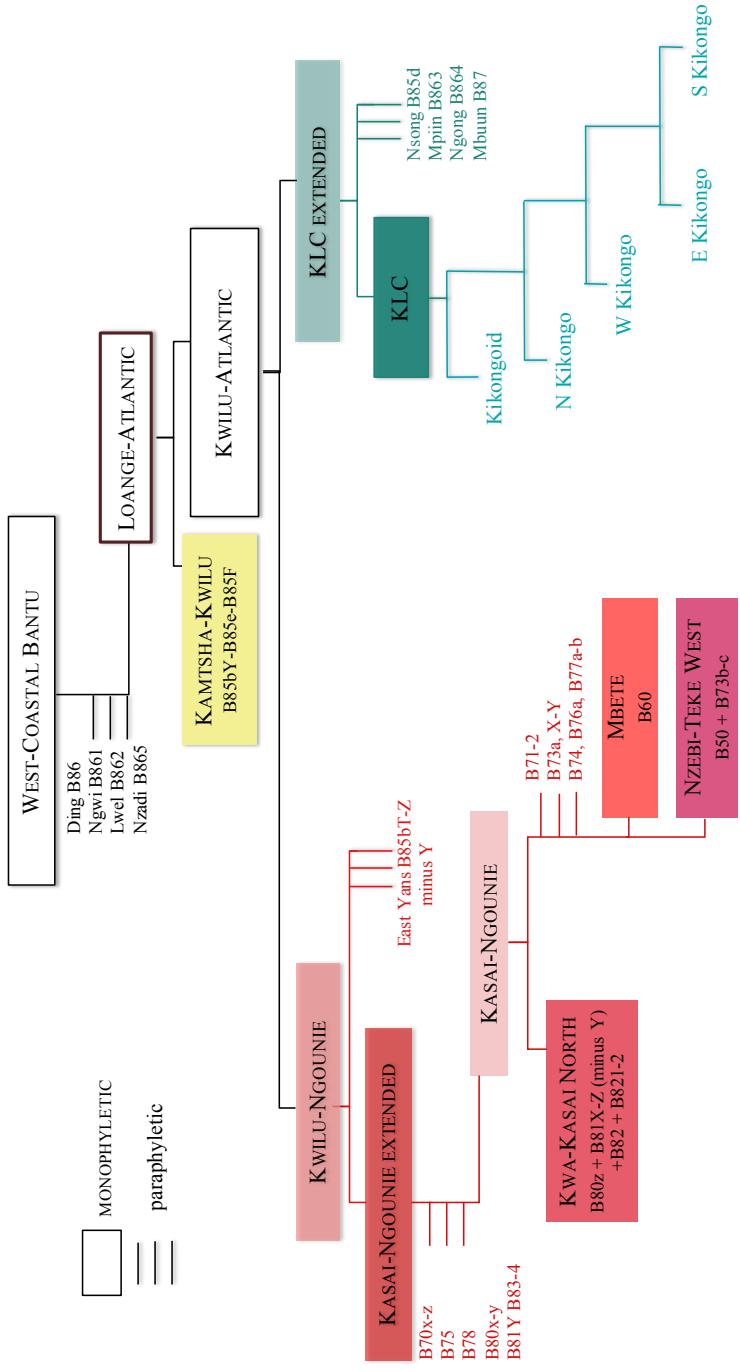


Figure 1. Internal lexiconbased phylogenetic classification of WCB (de Schryver *et al.* 2015; Pacchiarotti *et al.* 2019)

In Appendix 2, we list all varieties included in this study with their corresponding alphanumeric code, the phylogenetic subgroup to which they belong (see Figure 1) and the sources from which data were obtained. As discussed in Pacchiarotti *et al.* (2019: 160), lowercase x, y, z after a code ending in 0, as in B80z, mean that the variety is not inventoried in either Guthrie (1971) or Maho (2009). Uppercase X, Y, Z, etc. mean that we have data on varieties inventoried in Guthrie (1971) and/or Maho (2009) from more than one geographical location and we consider them to be regiolectal varieties of the same language (e.g. B865X refers uniquely to the Nzadi spoken in Indolo, while B865W to the Nzadi spoken in Panu-Ipanga). Because this study is about sound change, we selected the best possible convenience sample based on available phonological descriptions, lexicons and/or dictionaries. This means that the varieties selected for this study only partially overlap with the varieties represented in Pacchiarotti *et al.* (2019). For instance, while the phylogenetic study included a wordlist of Mbete B61 spoken in Gabon, in this study we include a variety of Mbete B61 spoken in the Republic of the Congo because we could get access to a grammatical description and a lexicon for this variety (Ndouli 2001). Varieties included in this study but not in Pacchiarotti *et al.* (2019) are shaded in gray in Appendix 2. This paper also includes original fieldwork data on Mpe B821, Nunu B822, and Ngwi B861 all spoken in the Democratic Republic of the Congo.

Whenever graphemes used for reflexes of PB velar stops in the original source did not correspond to International Phonetic Alphabet (IPA) symbols, we replaced them with IPA symbols for greater uniformity and comparability. The varieties which required this step are in Table 1.

Variety	Grapheme	IPA	Source
Punu B43	***gh***	***ɣ***	(Mavoungou & Plumel 2010)
Lumbu B44	***gh***	***ɣ***	(Mavoungou & Plumel 2010)
Duma B51Y	***g***	***ɣ***	(Mickala-Manfoumbi 1988)
Tsaangi B53X	***g***	***ɣ***	(Loubelo 1990)[1]
Nduumo B63Y	***h***	***x***	(Biton 1969)[2]
Fumu B77bX	***g***	***ɣ***	(Makouta-Mboukou 1976)

Table 1. Grapheme-IPA correspondences

1. Loubelo (1987) states that <**h**> corresponds to IPA **[h]** in Tsaangi B53. Loubelo (1990) uses <**g**> instead of <**h**> and states that the corresponding IPA symbol for <**g**> is **[ɣ]**.
2. Biton (1969: 555) writes that <***h***> is realized *ch* as in German *suchen*, i.e. ***[x]***. According to our understanding of the Nduumo B63 data in Biton (1969), <***h***> is in complementary distribution with <***g***>, which seems to appear only in front of <***e***>, <***i***> and <***u***>. Following Biton (1969: 555), <***g***> is realized as in French *goût* in all contexts, i.e. [***g***], but Medjo Mvé (1989) reports that it is realized as [ɣ] in between vowels.

In carrying out historical comparative work, we made use of reconstructed forms containing ***k*** and ***g*** in C1 and/or C2 position in the Bantu Lexical Reconstructions 2/3 (Coupez *et al.* 1998; Bastin *et al.* 2002) database. Whenever needed, for cognate sets not represented in the BLR 2/3 database, we posited a tentative new Proto-WCB (PWCB) reconstruction (see Appendix 1 for some examples).[3]

Besides the uncertainty in what to reconstruct, another major challenge in historical comparative work on WCB languages stems from the fact that second-hand language data are usually not transcribed phonetically but orthographically. As a result, the phonological status of vowel plus glide sequences (i.e. <**iy**> <**uw**>) is seldom transparent (see also Grégoire 2003: 352) and this might hinder the identification of reflexes of proto-sounds. Also, transcriptions of the "same" variety may unsurprisingly vary depending on the author. For instance, the reflexes of BLR 712 ***cùkʊd*** 'wash, cleanse' and BLR 2824 ***tég*** 'sell' in Ngungwel B72a are ***suwol*** and ***tíyo*** respectively according to Rurangwa (1982), but ***swɔɔl*** and ***tyɔ́ɔ́*** according to Raharimanantsoa (2016). If one looks only at the transcriptions of Rurangwa (1982), one might be misled to think that the reflexes of ***k*** and ***g*** in Ngungwel are /***w***/ and /***y***/ respectively, while the transcription of Raharimanantsoa (2016) rather suggests that the reflex of both ***k*** and ***g*** is zero (as is confirmed by other synchronic lexemes linkable to reconstructions with PB ***k*** and ***g*** in C2 position). Even when the orthographic notation closely reflects the phonetic output of a form, there might be phonological rules operating on the output that change the historical interpretation of a given reflex. For instance, in Yaa B73c, the reflex of BLR 418 ***càk*** 'desire, wish, search for' is <***sáá***> 'search', while the reflex of ***càk*** plus the deverbal agentive suffix ***-i**, i.e. ***càkì*** is <***mú-sáyî***>. By only looking at the orthography one might be tempted to say that the reflex of ***k*** in C2 followed by the high front vowel ***i*** in Yaa B73c is the voiced palatal approximant [***j***], conventionally noted by Africanists (and in this article) as <***y***>. However, Mouandza (2001: 71-72) analyzes <***sáyî***> as being underlyingly /***sáá+i***/. Thus, it seems that <***y***> is rather the synchronic outcome of vowel coalescence in Yaa B73c.

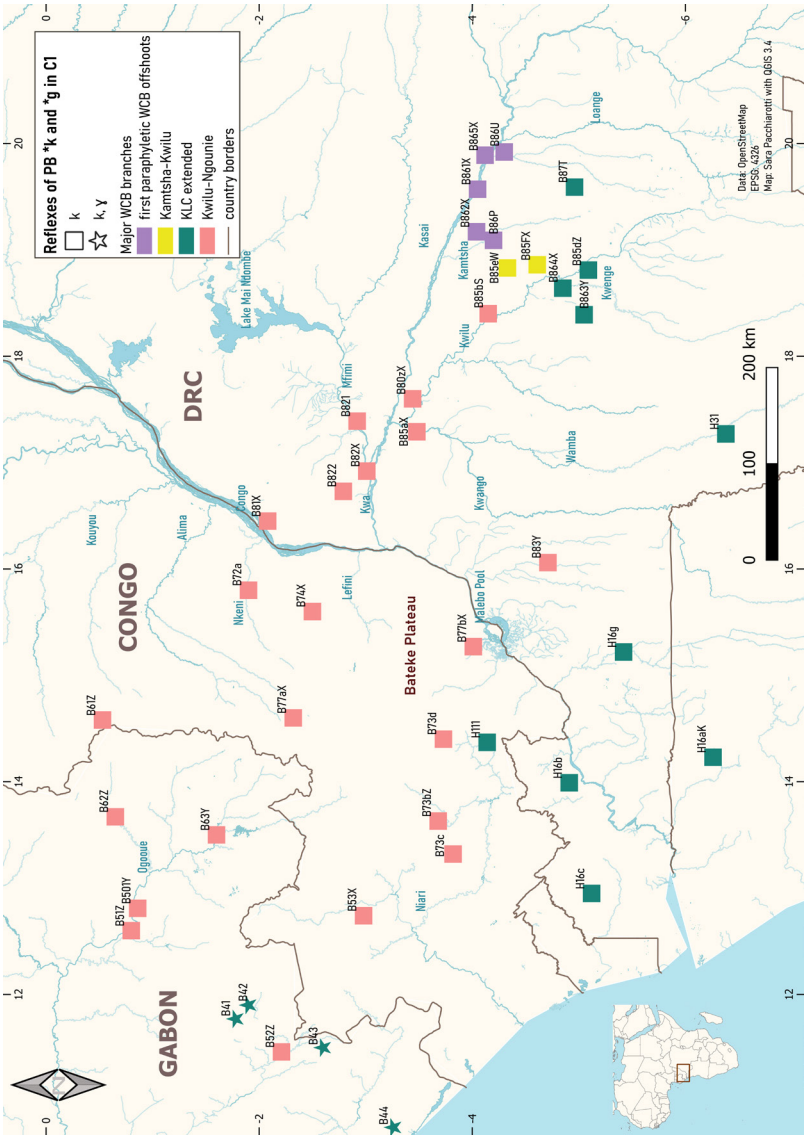
Despite these challenges, we provide in Appendix 1 the most widespread cognate sets in our database which prove the existence of the sound changes we argue to have occurred at PWCB stage or later (see §2). Cognate sets in Appendix 1 are ordered according to the BLR proto-form number (lower to higher) of which we believe they are a reflex. Each cognate set starts with the BLR proto-form index number, form and meaning, followed by the synchronic reflexes we could identify. Proto-forms not preceded by a BLR index number are tentative new PWCB reconstructions (cf. supra). Each reflex is preceded by a bolded alphanumeric code denoting a specific variety and its source as referenced in Appendix 2. We indicate

3. Reconstructions in BLR are numbered up to 9820 (Bastin *et al.* 2002; Bostoen & Bastin 2016). In the course of the BantUGent KongoKing (2012-2016) and BantuFirst (2018-2022) projects, more than 300 tentative proto-forms have been added mainly based on comparative evidence from the Kikongo Language Cluster (KLC) and WCB more widely. In Appendix 1 all reconstructions not having a number are those after 9820. These need to be checked against evidence from other Bantu branches and further fine-tuned, especially as far as tone is concerned.

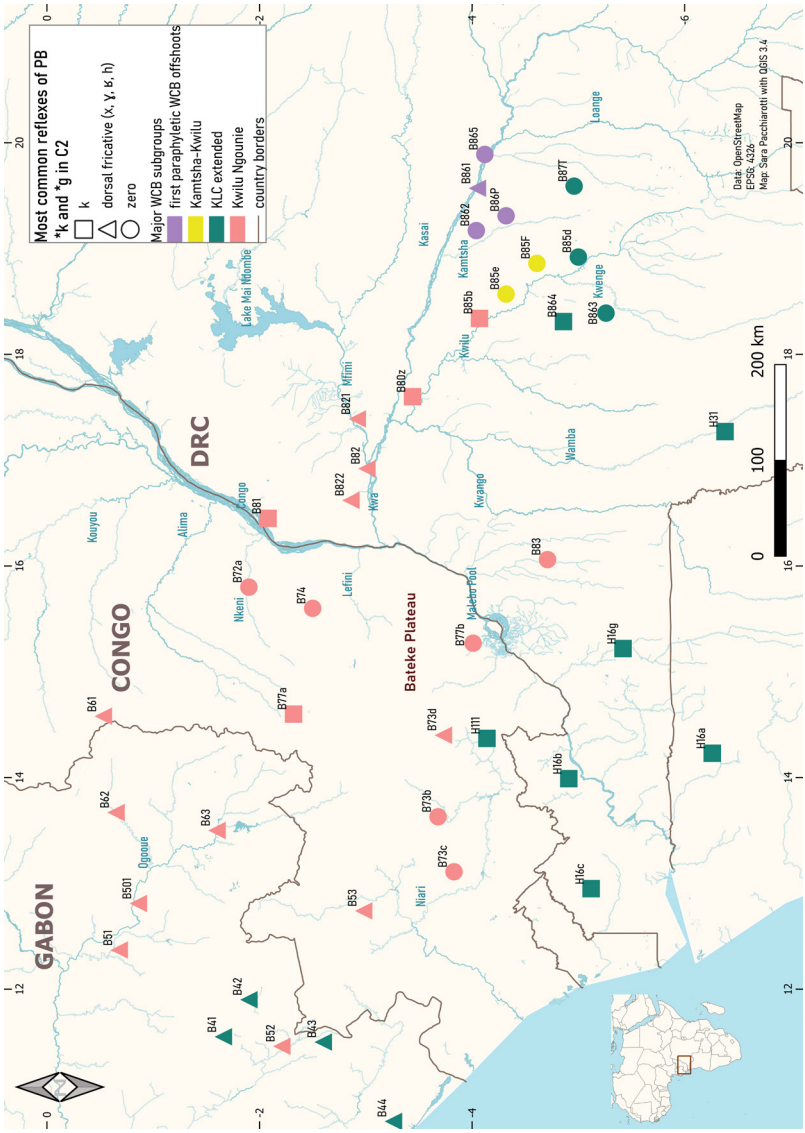
the meaning of reflexes only if they differ with respect to the "meaning(s)" assigned to the corresponding proto-form in the BLR2/3 database. We mark both high and low tone as [**á**] and [**à**] respectively. Absence of tone on a reflex means that we found no tone in the original source. The reflexes of a PB noun may or may not include a noun class prefix. When they do, we segmented the prefix only if we could corroborate that the prefix is not synchronically fossilized on the simple noun stem. The symbol '–' next to an alphanumeric code representing a variety means that the variety has a reflex of another protoform for a given concept. A question mark means lack of data.

2. The merger of PB velar stops in WCB

In this section we show that reflexes of PB ***k*** and ***g***, whatever their actual phonetic realization might have been, are the same in all present-day WCB languages, both in C1 and C2, when not preceded by a nasal. As Maps 1 and 2 show, three major groups of reflexes can be distinguished: (1) the voiceless velar stop **/k/** (§2.1), (2) different kinds of fricatives articulated in the back of the oral cavity (§2.2) and (3) zero (§2.3). These three main types of reflexes are shown on Map 1 for C1 position and on Map 2 for C2 position. As can be seen from these two maps, there is much more variation – and thus innovation – in C2 position. In §2.4, we argue that PB ***k*** and ***g*** must have already merged in PWCB through the devoicing of ***g*** and the consequent loss of the voicing contrast. While present-day **/k/** reflexes of PB ***k*** and ***g*** are retentions from PWCB, fricatives and zero are later innovations. Finally, in §2.5, we show that the velar merger did not take place in postnasal position.



Map 1. Reflexes of PB ***k*** and ***g*** in C1



Map 2. Reflexes of PB ***k*** and ***g*** in C2

2.1. Voiceless velar stop as reflex of PB ***k*** and ***g***

The occurrence of /***k***/ as the merged reflex of PB ***g*** and ***k*** is extremely widespread in C1 (see Map 1) compared to C2 (see Map 2). As for C1, Guthrie's B40 group (West Kikongo, KLC) is the only one to have /ɣ/, alongside the more frequent /***k***/ reflex. As for C2, languages consistently attesting /***k***/ are only found in the two major Kwilu-Atlantic subclades, i.e. Kwilu-Ngounie and KLC Extended (see Figure 1). Within Kwilu-Ngounie, only West Yans B85a and East Yans B85b as well as Tiene B81 and Boma Yumu B80z always have /***k***/. Within the KLC Extended, the entire KLC (apart from the B40 languages) mainly has /***k***/ in C2. Ngong B864 is the only paraphyletic variety of the KLC Extended which also has /***k***/.[4]

As the data in (1) show, Boma Yumu B80z is one of the WCB languages systematically having /***k***/ in C1 and C2 as the reflex of both PB ***k*** and ***g***. This language belongs to the Kwilu-Ngounie branch, one of the two main branches of Kwilu-Atlantic (see Figure 1).

(1) Boma Yumu B80z (Kwa-Kasai North, Kasai-Ngounie, Kwilu-Ngounie, Kwilu-Atlantic, Loange-Atlantic)

***g**$_1$*	BLR 1274	***gàb** 'divide, give away'*	> **ó-kab**
	BLR 1378	***gìdí** 'egg'*	> **i-kyɛl**
	BLR 1398	***gìdá** 'blood'*	> **ma-kla**
	BLR 1498	***gòg** 'be sufficient, be fitting'*	> **ó-kuka**
***k**$_1$*	BLR 1674	***kádí** 'woman, wife'*	> **mu-kɛ́r** 'wife'
	BLR 1793	***kídà** 'tail'*	> **mu-kíla**
	BLR 2003	***kódó** 'adult, senior, elder'*	> **kɛ-kwól** 'elder'
	BLR 9300	***káíntò** 'woman'*	> **mu-kár**
***g**$_2$*	BLR 316	***búgà** 'open space'*	> **m-búk** 'place'
	BLR 1100	***dòg** 'bewitch, curse'*	> **ó-lwak**
	BLR 1248	***dúg** 'paddle'*	> **o-dʒúka**
	BLR 2824	***tég** 'sell'*	> **o-tɛ́k**
***k**$_2$*	BLR 1179	***dúk** 'to vomit'*	> **ó-lúk-a**
	BLR 2741	***tákò** 'buttocks'*	> **kɛ-ták**
	BLR 3050	***tók** 'insult'*	> **o-túk-a**
	BLR 1044	***dìık** 'bury'*	> **ó-dʒik-a**

The voiceless velar stop as the reflex of both PB ***k*** and ***g*** in C1 and C2 is also attested in the other major Kwilu-Atlantic branch, i.e. KLC Extended (cf. Figure 1), as illustrated in (2) with data from Ntandu H16g.

4. In some sources on Ngong B864, the grapheme <**g**> is used. Because no synchronic phonological description of Ngong is available to us, we could not determine its precise phonetic value, but we think it could equal IPA **[g]** because some sources report that in Ding and Yans varieties **/k/** in word-final position can become voiced.

(2) Ntandu H16g (East Kongo, KLC Extended, Kwilu-Atlantic, Loange-Atlantic)

*g_1	BLR 1274	***gàb*** ‘divide, give away’	> **kab-a**
	BLR 1331	***gàng*** ‘tie up’	> **kaang-a**
	BLR 1440	***gòn*** ‘snore, sleep, lie down’	> **kon-a** ‘snore’
	BLR 1504	***gòmb*** ‘dig trench’	> **kuumb-a** ‘scrape, weed’
*k_1	BLR 1689	***kám*** ‘squeeze’	> **kaḿ-a** ‘milk, squeeze’
	BLR 1805	***kín*** ‘dance’	> **kín-a**
	BLR 1914	***kóm*** ‘hit, beat, kill’	> **kóm-a** ‘hit’
	BLR 1747	***kéb*** ‘look (at)’	> **kéb-a**
*g_2	BLR 316	***bógà*** ‘open space’	> **mbúka** ‘shelter’
	BLR 1100	***dòg*** ‘bewitch, curse’	> **lok-a**
	BLR 1248	***dúg*** ‘paddle’	> **duk-a** ‘stir’
	BLR 3291	***jégam*** ‘lean against’	> **yékám-a**
*k_2	BLR 1179	***dók*** ‘vomit’	> **lúk-a**
	BLR 2741	***tákò*** ‘buttocks’	> **táku**
	BLR 2828	***ték*** ‘draw water’	> **ték-a** ‘draw’
	BLR 1044	***dìık*** ‘bury’	> **ziik-a**

Outside the Kwilu-Atlantic subclade, **/k/** as the merged reflex of PB ****k*** and ****g*** is also found in its sister subclade Kamtsha-Kwilu (cf. Figure 1). Mpur B85eX is a Kamtsha-Kwilu language that has the **/k/** reflex in both C1 and C2, as shown in (3).

(3) Mpur B85eX (Kamtsha-Kwilu, Loange-Atlantic)

*g_1	BLR 1274	***gàb*** ‘divide, give away’	> **ú-káb**
	BLR 1368	***gí*** ‘egg’	> **kyi**
	BLR 1398	***gìdá*** ‘blood’	> **a-kyíl**
	BLR 1490	***gòdò*** ‘leg’	> **lu-kól**
*k_1	BLR 1674	***kádí*** ‘woman, wife’	> **ukyay** ‘wife’
	BLR 1793	***kídà*** ‘tail’	> **ú-kíl**
	BLR 2027	***kómì*** ‘ten’	> **kwem**
	BLR 9300	***káíntò*** ‘woman’	> **ú-kár**
*g_2	BLR 258	***bògó*** ‘buffalo’	> **i-bɔ́k** ‘hippopotamus’
	BLR 1100	***dòg*** ‘bewitch, curse’	> **ul-ɔ́k**
	BLR 1248	***dúg*** ‘paddle’	> **u-luk**
*k_2	BLR 2368	***pàkàcà*** ‘buffalo’	> **m-pákásà**
	BLR 7983	***kéèkéè*** ‘little, small; few’	> **kikiə**
	BLR 427	***càkan*** ‘play’	> **nsák** ‘game’
	BLR 9629	***cakıd*** ‘clap hands’	> **sák** ‘joy’

As illustrated in (4), **/k/** also occurs in Nzadi B865, which is one of the four paraphyletic languages to split off first from the ancestral WCB node. Just like Ngwi B861, Lwel B862 and Ding B86, Nzadi is parallel to the Loange-Atlantic subclade containing the rest of the present-day WCB languages (cf. Figure 1).

(4) Nzadi B865X (WCB)

*g_1	BLR 1275	***gàbʊd** ‘divide ’	> **o-kab-ul**
	BLR 1378	***gìdí** ‘egg’	> **i-kil**
	BLR 1398	***gìdá** ‘blood’	> **mi-kíl**
	BLR 1490	***gùdù** ‘leg’	> **lɪ-kúl**
*k_1	BLR 1674	***kádí** ‘woman, wife’	> **mu-kal** ‘wife’
	BLR 1793	***kídà** ‘tail’	> **mu-kyál**
	BLR 2003	***kúdú** ‘adult; elder’	> **a-kur**
	BLR 9300	***káíntù** ‘woman’	> **o-káàr**
*g_2	BLR 574	***cígé** ‘horn’	> **i-ʃík**
	BLR 1100	***dòg** ‘bewitch, curse’	> **o-lɔk**
	BLR 1621	***jùgú** ‘groundnut’	> **n-dzuk**
*k_2	BLR 429	***càkʊd** ‘weed’	> **o-sakul**
	BLR 647	***còká** ‘axe’	> **sôk**
	BLR 1044	***dìɪk** ‘bury’	> **o-dzik**
	BLR 2513	***pìkà** ‘slave’	> **m-pîk**

2.2. Fricative reflexes of PWCB ***k***

The KLC languages of Guthrie’s B40 groups are the only ones to have the voiced velar fricative /ɣ/ as a regular reflex of PB ***k*** and ***g*** in both C1 and C2, as shown in (5).

(5) Punu B43 (West Kongo, KLC (Extended), Kwilu-Atlantic, Loange-Atlantic)

*k_1	BLR 1674	***kádí** ‘woman, wife’	> **mu-ɣátsi**
	BLR 1793	***kídà** ‘tail’	> **mu-ɣíla**
	BLR 1755	***kèd** ‘cut’	> **u-ɣědə**
	BLR 2003	***kúdú** ‘adult; elder’	> **mu-ɣúlu**
*g_1	BLR 1274	***gàb** ‘divide, give away’	> **u-ɣăbə**
	BLR 1440	***gòn** ‘snore, sleep, lie down’	> **u-ɣóni**
	BLR 1312	***gàn** ‘think’	> **u-ɣánə**
	BLR 1343	***gèd** ‘measure’	> **u-ɣělə**
*k_2	BLR 198	***bík** ‘announce (death)’	> **u-bíɣə**
	BLR 1044	***dìɪk** ‘bury’	> **u-tsĭːɣə**
	BLR 2828	***ték**‘draw (water)’	> **u-téɣə**
	BLR 3526	***jókà** ‘snake; intestinal worm’	> **Ø-nyóɣə**
*g_2	BLR 2568	***pígò** ‘kidney’	> **mu-píɣu**
	BLR 136	***bèg** ‘bring’	> **u-bĕɣə**
	BLR 967	***dìgù** ‘friend, relative’	> **ndĭɣu**
	BLR 3340	***jìgá** ‘clay for pottery’	> **dîːɣə**

In C2 position, PB ***k*** and ***g*** shifted to several distinct fricatives in several varieties. Sources on the “same” variety often vary with respect to the place of articulation and voicing of the fricative. Although detailed phonetic studies are pending, it seems that PB ***k*** and ***g*** have at least the following fricative reflexes in C2 within WCB: [**x**], [**ɣ**] , [**ʁ**] and [**h**]. The fricative innovation is illustrated in (6) and (7) with recently collected fieldwork data from Mpe B821 and Ngwi B861 respectively.

(6) Mpe B821 (Kwa-Kasai North, Kasai-Ngounie (Extended), Kwilu-Ngounie, Kwilu-Atlantic, Loange-Atlantic)

*k_2	BLR 260	***bókò*** ‘arm’	> **è-bóʁò**
	BLR 1685	***kààká*** ‘grandparent’	> **Ø-nkàʁá**
	BLR 2828	***ték*** ‘draw water’	> **kò-téʁè**
	BLR 67	***bák*** ‘get, catch, rob’	> **kò-báʁà** ‘find’
*g_2	BLR 1248	***dúg*** ‘paddle’	> **kò-dvúʁà**
	BLR 2569	***pígò*** ‘kidney’	> **è-píʁò** ‘liver, lung’
	BLR 3527	***jògà*** ‘mushroom’	> **mw-òʁò** ‘gray mushroom’
	BLR 1621	***jògó*** ‘groundnut’	> **è-dʒùʁú**

(7) Ngwi B861X (WCB)

*k_2	BLR 1904	***kókó*** ‘chicken’	> **ŋ̀-kóʁ**
	BLR 6108	***cìkà*** ‘girl, woman’	> **ò-sɔ̀ʁ** ‘unmarried woman’
	BLR 9605	***pákù*** ‘honey’	> **m̀-pâʁ**
	BLR 3052	***túʊk*** ‘come from’	> **ntswâʁ**
*g_2	BLR 1621	***jògó*** ‘groundnut’	> **è-yŭʁ**
	BLR 2569	***pígò*** ‘kidney’	> **è-pə̂ʁ** ‘liver’
	BLR 316	***búgà*** ‘village, path’	> **m̀-bûʁ** ‘path’
	BLR 3525	***jóg*** ‘swim’	> **ndʒwâʁ**

2.3. Zero (**Ø**) reflexes of PWCB ****k***

The last sound change to be discussed is the loss of PB ****k*** and ****g*** in C2. KLC Extended paraphyletic varieties such as Nsong B85d, Mpiin B863 and Mbuun B87, the Kamtsha-Kwilu varieties Mpur B85e and Nsambaan B85F, as well as the WCB paraphyletic varieties Ding B86, Lwel B862, and Nzadi B865 branching off first all lost PB velar stops in C2. Loss is also found in the paraphyletic Kasai-Ngounie (Extended) varieties Ngungwel B72a, Eboo-Nzikou B74, Fumu B77b and Mfinu B83. Within the Nzebi-Teke West group, loss occurs in Laali B73b and Yaa B73c. This innovation is illustrated in (8) with data from Mbuun B87.

(8) Mbuun B87T (KLC (Extended), Kwilu-Atlantic, Loange-Atlantic)

*k_2	BLR 522	***cèk*** ‘laugh, joke’	> **ká-ʃéé**
	BLR 1044	***dìɪk*** ‘bury, plant’	> **ká-dzĩ́**
	BLR 1179	***dúk*** ‘vomit’	> **ká-lúú**
	BLR 820	***dáká*** ‘tongue, language, jaw’	> **ndáá**
*g_2	BLR 1498	***gùg*** ‘be fitting, sufficient’	> **ka-kuu**
	BLR 1607	***jògù***‘elephant’	> **nzɔ́ɔ̀**
	BLR 2825	***tég***‘set (trap)’	> **ka-téé**
	BLR 3527	***jògà***‘mushroom’	> **bóó**

2.4. The PWCB merger of PB velar stops

The data presented so far in this section show that whatever the actual reflex of PB ***k*** and ***g*** in present-day WCB languages may be, the original phonemic opposition between a voiced and an unvoiced velar consonant was lost. As the loss of this voicing contrast is observed in all WCB languages without exception, the most economical reconstruction is to posit it as a shared innovation that occurred only once, i.e. minimally at the stage of PWCB, the clade's most recent common ancestor. Following the same rule of parsimony, the merger must have been brought about through the devoicing of PB ***g***. No present-day WCB language has the voiced velar stop as reflex of either PB ***k*** and ***g***, while all have the unvoiced velar stop as the regular reflex of PB ***k*** and ***g*** in C1 and many also in C2. The voiceless velar stop is a retention shared by all major WCB subgroups. As summarized in (9), we therefore reconstruct ***k*** as the merged PWCB reflex of both PB ***k*** and ***g***. The evolution path in (9) also indicates that we consider all other WCB reflexes of PB ***k*** and ***g***, both the different kinds of fricatives and zero, as innovations that took place after PWCB split up in daughter languages.

(9) The evolutions of PB ***k*** and ***g*** in WCB

PB		PWCB		Post-PWCB
***k**				
	>	***k**	>	**x/ɣ/ʁ/h/ø**
***g**				

As Gérard Philippson (pers. comm.) pointed out to us, the devoicing of PB ***g*** in C2 position is an instance of unconditioned fortition (Campbell 2004: 44), a rather rare sound change, especially when the consonantal inventory of the (ancestral) language already contains /***k***/. At the same time, it is also true that from a purely phonatory point of view, apart from uvulars, voicing is hardest to maintain for velar plosives (Maddieson 1984: 36-37; Blust 1996: 149 and references therein). We entertain a speculative explanation for this unconditioned fortition in §4.

For the time being, we refrain from further seriating these subsequent innovations and from assessing their implications for the internal classification of WCB, as this goes beyond the scope of the current article. At this stage, we simply wish to point out that many current-day WCB languages have multiple unconditioned reflexes of PB ***k*** and ***g*** or PWCB ***k*** when not preceded by a nasal. As the data in Appendix 1 show, several languages have, apart from the retention of PWCB ***k***, one or sometimes even two of the post-PWCB innovations in (9). As we will see in §3, PB ***k*** and ***g*** also have multiple unconditioned reflexes in northwestern Bantu languages outside of WCB. Assessing the origins of this lack of Neogrammarian regularity across all targetable lexical items in WCB will be the topic of a future paper.

A last issue to be discussed in this subsection is the seriation of the C1 velar merger in relation to Bantu Spirantization (BS). In WCB, BS occurs very irregularly both in C1 and C2 positions. BS is traditionally conceived as a sound change which

creates a fricative or an affricate when the input is a stop followed by the PB high vowels ***i*** and ***u*** (Schadeberg 1995; Bostoen 2008). While spirant devoicing is quite common in the KLC (Bostoen & Goes 2019), this is not so in the rest of WCB, at least not in C1 position. The few spirantized reflexes of PB voiced stops ***b*** and ***d*** in C1 are always voiced and those of PB voiceless stops ***p***, ***t*** and ***k*** in C1 are voiceless, as shown in (10).

(10) Nduumo B63Y (Mbete, Kasai-Ngounie (Extended), Kwilu-Ngounie, Kwilu-Atlantic, Loange-Atlantic)

BLR 2926	***tínà** ‘root, tree trunk, banana tree’	> **li-sina** ‘bunch of herbs/trees’
BLR 2558	***píò** ‘cold’	> **pfyo**
BLR 2128	***kúmú** ‘chief	> **pfumu**
BLR 368	***búdà** ‘rain’	> **m-vula**
BLR 1006	***díá** ‘water’	> **n-dʒa**
BLR 1248	***dúg** ‘paddle’	> **dʒuha**

Outside the KLC, spirant devoicing only occurs in C2 in some B80 varieties as shown in (11) and (12). Non-spirantized consonants are usually not devoiced in final position in B80 languages.

(11) BLR 897	***dèdù** ‘beard, chin’	>	B85dZ	**n-dɛts** ‘beard’
			B863Y	**ki-lɛ́ts** ‘beard’
			B864X	**kɛ́-lɛ́ts** ‘beard’
			B87W	**n-dwɛ́ts** ‘beard’
(12) BLR 3160	***jàdí** ‘oil’	>	B85dZ	**m-ês** ‘fat’
			B85FX	**mb-ɛas** ‘fat’
			B863Y	**mb-ês** ‘fat’
			B864X	**m-âts** ‘fat’
			B87W	**m-âts** ‘fat’

The fact that the few spirantized reflexes of PB ***b*** and ***d*** in C1 are voiced is in sharp contrast with the observation that the few spirantized reflexes of PB ***g*** in C1 outside of the KLC are never voiced, as shown in (13), see (54) in the Appendix for a full cognate set.[5]

(13) BLR 1398	***gìdá** ‘blood’	>	B85dZ	**má-tsil**
			B85FX	**má-tsil**
			B863Z	**má-tsil**
			B864X	**má-tsil**
			B87W	**á-tsìl**

5. It is important to note that in some WCB languages, voiceless stops, i.e. reflexes of ***t***, ***k*** and ***g***, can also shift to [***ts***], [***tʃ***] or even [***s***] in front of second-degree PB ***ɪ***. See for instance the reflexes of BLR 4565 ***bòdí*** ‘beard’: B85dZ ***bós*** ~ ***ɛbɔts*** ‘neck’, B85FX ***ɛ́bɔ́s*** ‘neck’, B863Y ***bots*** ‘neck’, B864X ***bɔ́ts*** ‘neck’, B87W ***ibɔts*** ‘neck’. In other words, as the same consonant mutation is observed in front of first and second-degree PB vowels, it is strictly speaking not BS.

The data in (13) strongly suggest that irregular BS occurred independently in some B60 and B80 varieties after the merger of ***k**/***g** > ***k*** in C1. If BS had taken place before the merger of ***k**/***g** > ***k*** in C1, there would be at least some evidence of voiceless spirantized reflexes of original ***k*** vs. voiced spirantized reflexes of original ***g**, as it happens in some languages for other places of articulation, see (10). A possible complication with this chronological ordering is the fact that in the KLC, the few spirantized reflexes of ***g*** in C1 are voiced, as shown in (14)-(16).

(14) BLR 1389 ***gì** 'fly' CL3/4, 9/10, 11/10 ~
BLR 1406 ***gìngì** 'fly' CL1a/2, 9/10 > B43 **du-nzi**
H11 **nzí**
H16a **nzi**
H16b **nzi**
H16c **nzíinzi**
H16g **nzinzi**
H31 **ndzííndzí la**

(15) BLR 1397 ***gìdà** 'taboo' CL7/8 > H16a **mu-zila** 'indecent, carnal'
H16g **ki-zila**

(16) BLR 1532 ***gùbú** 'hippo' CL9/6, 9/10 > B43 **Ø-mvubu**
H16a **nguvu**
H16b **mvubu**
H16c **mvúubu**
H16g **ngufú**
H31 **ngúfu**

These data posit a serious problem because (13) suggests that sporadic BS would have occurred after the merger in Kwilu-Ngounie (see Figure 1), while data in (14)-(16) suggest that sporadic BS would have occurred before the merger in its sister clade KLC Extended, hence the voiced spirantized reflexes. This apparent complication can be solved by positing that at PWCB level, the BLR reconstructions in (14)-(16) must have all belonged to class 9. As we explain in §2.5, the velar merger did not take place after the nasal prefixes of classes 9/10. This explains why PB ***g*** in (14)-(16) was not devoiced and its spirantized reflexes ended up being voiced. Some were further reassigned to another class, cf. H16g ***ki-zila*** in (15) vs. B51Z ***ŋgìdí***, B73c ***Ø-ngîri***, B81X ***ngìlé***. Evidence for the fact that the noun stems in (14)-(16) belonged to class 9 at PWCB level can be found in (52), (53) and (55) in the Appendix. Having solved this apparent mismatch, we posit that irregular BS would have taken place independently in some WCB subgroups and targeted those lexical items that had escaped the merger.

2.5. The absence of PWCB velar merger in postnasal position

As hinted at in §2.4, WCB languages did not undergo the sound change in C1 with noun stems preceded by the prefixes of noun classes 9/10 (SG/PL), both reconstructed as non-syllabic homorganic nasals (cf. Meeussen 1967: 97). In this environment, the voicing contrast between ***k** and ***g** was maintained in C1.[6] We show this with data from Yaa B73c in (17). All the proto-forms in (17) are reconstructed in classes 9/10 in BLR. In front of the voiceless velar stop, the nasal prefix becomes zero in Yaa B73c, as in many other Bantu languages (cf. Kerremans 1980: 171). In front of the voiced velar stop, it was maintained but reanalyzed as part of the noun stem.

(17) Yaa B73c (Nzebi-Teke West, Kasai-Ngounie (Extended), Kwilu-Ngounie, Kwilu-Atlantic, Loange-Atlantic)

*ŋg$_1$	BLR 1493	***gòdó** ‘pig’	>	**Ø-ngúlù**
	BLR 1357	***gèmbóá** ‘bat’	>	**Ø-ngéèmbú**
	BLR 7154	***gòì** ‘leopard’	>	**Ø-ngɔ́** ‘panther’
	BLR 1389	***gì** ‘fly’	>	**Ø-ngí**
*ŋk$_1$	BLR 1664	***kádá** ‘crab’	>	**Ø-kấlá**
	BLR 1880	***kódá** ‘snail’	>	**Ø-kɔ́lɔ́**
	BLR 2036	***kúmbó** ‘(sur)name’	>	**Ø-kúűmbú**
	BLR 1872	***kócì** ‘lion’	>	**Ø-kɔ́sì**

The preservation of the voicing contrast after the classes 9/10 nasal prefixes can be lost due to language contact. For instance, in some Tiene B81 varieties, some historical ***ŋg*** in C1 have a /***ŋk***/ reflex, probably due to contact with the Sakata cluster (C34), where many historical *ŋg in C1 evolved into /***ŋk***/ or /***ŋx***/ (cf. De Witte 1955). In the same vein, Ellington (1977: 166) reports ***ŋgaa*** ‘medicine man’ as a reflex of BLR 1332 ***gàngà*** ‘medicine man’ (classes 1/2, 9/10) in the central Tiene variety known as Dya, while Motingea Mangulu (2004: 128) reports ***ŋka:*** ‘medicine man’ in the southern variety of Tiene known as Nkɛtɛ. Similarly, the reflexes of BLR 1446 (CL9) ***gòndé*** ‘crocodile’ are ***nkwaan*** in Lwel B862 (Khang Levy 1979: 127) and ***ŋkwăn*** in Nzadi B865 (Crane *et al.* 2011: 286), i.e. /***nk***/ shows up where we would expect /***ng***/ (see (48) in Appendix 1). During recent fieldwork in the Kwilu Province of the DRC, we learned that in several places along the left bank of Kasai River (see Map 1), Lwel B862 and Nzadi B865 speakers live interspersed with Sakata C34 speakers with whom they sometimes intermarry. As mentioned above, in Sakata as in other zone C languages, the voicing contrast between PB ***g*** and ***k*** in postnasal position was not maintained (cf. Grégoire 2003: 356).

In WCB, the nasal prefixes of classes 9/10 prevented the merger from happening regardless of whether they were historical, as in (17), or innovative in individual

6. In C2, the contrast between PB ***ng*** and ***nk*** is usually maintained in conservative WCB languages having **/ŋg/** and **/ŋk/** as reflexes. However, in many WCB varieties both PB ***ng*** and ***nk*** either reduced to a simple nasal, e.g. ***/ŋ/***, or went to zero. We do not further consider their reflexes here, since root-internal PB ***ng*** and ***nk*** are considered as single phonemes different from PB ***g*** and ***k***.

languages or in a more recent common ancestor of some languages. For instance, the reflex of BLR 1397 ***gìdà*** 'taboo' reconstructed with noun classes 7/8 must have shifted to CL9 at some high node of PWCB and was exempt from the merger, e.g. B51Z ***ŋgìdí***, B73c ***Ø-ngîri***, B81X ***ngìlé***; see (53) in the Appendix for a full cognate set. Interestingly, the postnasal retention of the voicing contrast between PB ****g*** and ****k*** in WCB can be a diagnostic to revise certain lexical reconstructions in BLR 3 (Bastin *et al.* 2002). As an example, consider BLR 9642 ****káká*** 'foot' attested only in zone C according to BLR3. However, as shown in (18), we also find reflexes in some zone B languages, though with the meaning 'hand, arm'.

(18)	BLR 9642	***káká** 'foot'	>	Nzebi B52Z **lə́-káká** 'hand'
				Mbete B61Y **ŋgaɣa** 'hand'
				Teke Ewo B71b **ŋgàgá** 'hand'
				Laali B73bX **lí-kákà** 'hand, arm'

In all the varieties in (18), ****k*** and ****g*** > ***k*** in C1 except when preceded by a class 9/10 prefix. In this case, historical ****k*** and ****g*** preserve their voicing contrast. The reflexes found in Mbete B61Y and Teke Ewo B71b suggest that BLR 9642 ****káká*** should probably be reconstructed as ****gáká*** or ****gágá***. This is because while ****k*** preceded by a nasal in C1 is never voiced in these languages, in some instances ****g*** preceded by a nasal can irregularly be devoiced (cf. supra). This is possibly what happened with the Nzebi B52Z and Laali B73bX reflexes, which lost the class 9 nasal prefix and assigned a new noun class prefix to this noun stem.

3. The merger of PB velar stops outside WCB

In the preceding sections, we have shown that the merger of PB velar stops in C1 and C2 position happened at WCB level. In this section we consider evidence outside of WCB to assess whether such a merger could be taken as a unique shared innovation diagnostic for the genealogical unity of WCB vs. other Bantu branches. We discuss comparative evidence by referring to the major Bantu clades as identified in the up-to-now most comprehensive Bantu phylogeny of Grollemund *et al.* (2015) summarized in Figure 2. We do so in order to be able to assess at the ancestral node of which clades the velar merger could possibly be posited as a shared innovation. As Figure 2 shows, the Bantu family tree in Grollemund *et al.* (2015) is one where major clades split off one by one from the tree's central backbone. The labels based on cardinal directions (NW, CW, WW, SW, E) and associated colors often do not mark actual phylogenetic clades, but are rather inspired by previous classifications (e.g. Vansina 1995; Bastin *et al.* 1999). The only true clades are Central-Western Bantu (CWB) and West-Western Bantu (WWB = WCB). North-Western Bantu (NWB) covers at least five distinct clades. South-Western Bantu (SWB) and Eastern-Bantu (EB) are actually not discrete clades, but constitute one single superclade, as we have tried to represent in Figure 2.

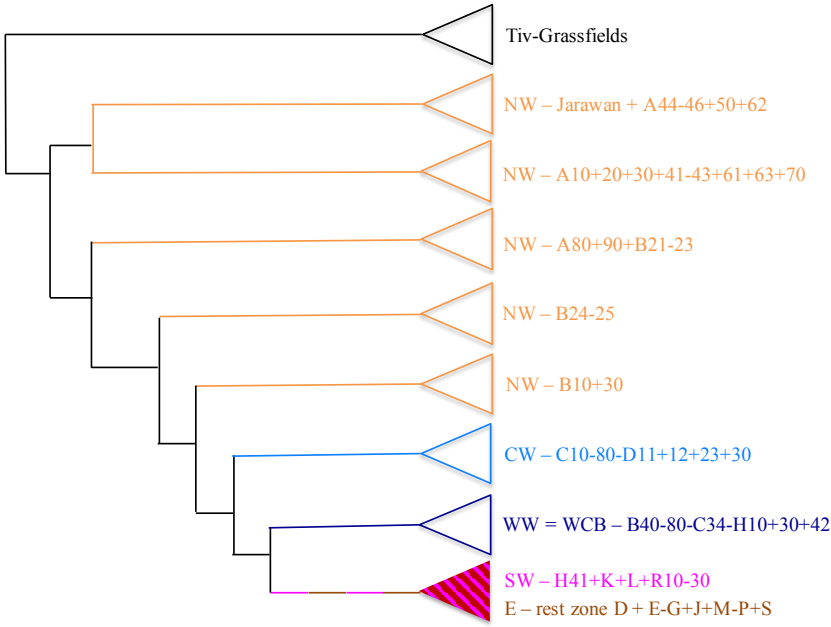


Figure 2.
Schematic depiction of the Bantu phylogeny in Grollemund *et al.* (2015)

3.1. Velar merger in SWB and EB

Even if the merger did take place in some SWB languages such as Pende L11 (Ntitenguha 1984), spoken immediately to the south of the WCB area, there is undisputable evidence that it cannot be reconstructed to the most recent common ancestor of SW Bantu. The merger did not happen in Cokwe K11 (Kanyamibwa 1982), Holu L12b (Kashika Katanga 1990), Ruund L53 (Mulindabigwi 1981) and zone L more generally (Kabange Mukala 2009). We show the absence of a velar merger in SWB in (19) with Mbundu H21a data where PB ***g**$_1$* and ***g**$_2$* > Ø, whereas PB ***k**$_1$* and ***k**$_2$* > ***k***.

(19) Mbundu H21a (SWB) (da Silva Maia 1961)

*g$_1$	BLR 1300	***gàdí*** ‘(nut of) oil palm’	>	**ma-aji**
	BLR 1362	***gènd*** ‘walk, travel, go (away)’	>	**ku-enda**
	BLR 1309	***gàmb*** ‘speak, answer’	>	**amba**
	BLR 1334	***gàngà*** ‘medicine’	>	**wanga** ‘fetish’
	BLR 1374	***gìd*** ‘act, do, say, have’	>	**ila**
	BLR 1440	***gòngò*** ‘back, backbone’	>	**mu-ongo**
	BLR 1505	***gùmbà*** ‘barren woman’	>	**mu-umba**
*g$_2$	BLR 1100	***dòg*** ‘bewitch’	>	**lowa**
	BLR 197	***bìgá*** ‘pot’	>	**mbiá**
	BLR 3525	***jóg*** ‘bathe, wash, swim’	>	**ku-ówa**

*k_1	BLR 1662	***kádà** ‘ember(s), charcoal’	>	**kala**
	BLR 1674	***kád** ‘woman, wife’	>	**mu-kaji**
	BLR 1689	***kám** ‘squeeze’	>	**kama**
	BLR 1805	***kín** ‘dance’	>	**kina**
*k_2	BLR 2642	***púkò** ‘rodent, rat, mouse’	>	**puku**
	BLR 2741	***tákò** ‘buttocks’	>	**ma-taku**
	BLR 3526	***jókà** ‘snake, intestinal worm’	>	**ɲoka**

It is well-known that most EB languages did not undergo the velar merger (cf. Guthrie 1967: 62, 75; Möhlig 1981: 299). The reconstruction of a voicing opposition for velar stops in PB is actually mostly based on EB languages (cf. Meinhof 1899). As for EB languages geographically close to WCB, Kabange Mukala (2009) provides evidence for the absence of the velar merger in several Congolese EB languages of zone M, as Rugigana (1982) does for Lega D25 and Holoholo D28.[7] Note in (20) that some PB *g_1 are lost in Holoholo.

(20) Holoholo D28 (EB) (Rugigana 1982: 105ff.)

*g_1	BLR 1317	***gì** ‘go’	>	**gì**
	BLR 1349	***gèdà** ‘iron (thing)’	>	**gèlà**
	BLR 1298	***gàdì** ‘mash, pap’	>	**gàlì**
	BLR 7157	***gòìnà** ‘crocodile’	>	**gwènà**
	BLR 1362	***gènd** ‘walk, travel, go (away)’	>	**ènd** ‘go’
	BLR 1313	***gàn** ‘tell a tale’	>	**àn** ‘say’
	BLR 1431	***gòmb** ‘clap hands, beat drums’	>	**òmb** ‘play the drum’
*g_2	BLR 137	***bég** ‘shave’	>	**bég**
	BLR 258	***bògó** ‘buffalo’	>	**bògò**
	BLR 1607	***jògù** ‘elephant’	>	**jògì**
*k_1	BLR 1793	***kídà** ‘tail’	>	**kìlá**
	BLR 1935	***kòndè** ‘banana’	>	**kòndè**
	BLR 1758	***kédè** ‘salt’	>	**kèlé**
	BLR 1927	***kómbó** ‘broom’	>	**kòmbó**
*k_2	BLR 905	***dèk** ‘let (go), cease’	>	**lèkel** ‘let’
	BLR 9582	***dák** ‘walk’	>	**lák** ‘move’
	BLR 1179	***dók** ‘vomit’	>	**lúk**
	BLR 3050	***túk** ‘insult, abuse’	>	**túk**

It is clear that the merger of PB velar stops in C1 and C2 did not take place in the SWB/EB superclade, including several zone D groups usually considered as part of so-called “Forest Bantu” (Nurse & Philippson 2003: 177).

7. Within the westernmost D10 group, Rugigana (1982: 27ff.) shows that the merger did take place in Mituku D13, i.e. *k_1, *g_1 > **k**, *k_2 > **k**, **Ø**, and *g_2 > **k**. D13 is classified as EB in Grollemund *et al.* 2015, while other varieties within D10 such as Mbole D11 and Lengola D12 end up in CWB.

3.2. Velar merger in CWB

The situation in the northwestern area around WCB, i.e. in CWB and NWB, is more complex. This complexity partially arises from the fact that almost all sources report the existence of multiple unconditioned reflexes for one or both of the PB velar stops in either C1, C2, or in both positions. However, with the exception of Janssens (1993), these sources do not present systematic accounts such as the one we put forward in §2 for the evolution of PB velars in specific subgroups. Hence, claims related to multiple unconditioned reflexes cannot be taken at face value, because they are not substantiated by sufficient empirical evidence. Upon closer scrutiny, some of these irregular correspondences might be explained by previously unnoticed conditioning environments. Despite these limitations, in what follows we present a review of sources attesting a putative velar merger identical or similar to the one we describe in this paper for WCB following Guthrie's referential groups. When we report more than one reflex for the same protosound, we order them in terms of frequency as in the original source unless otherwise specified. In all cases reported in this subsection and in §3.3 (except in Bubi A30, C60-80, and partially Nen A44), the merger did not take place when PB ***g*** was preceded by a nasal (cf. §2.5).

For the zone D languages belonging to CWB according to Grollemund *et al*. (2015), we could not find sufficient evidence. For the zone C languages belonging to CWB according to Grollemund *et al*. (2015) for which we could find diachronic phonological accounts, most sources attest a merger of PB velar stops similar to the one attested in WCB:

- Leke C14: $*k_1/*k_2 > k$, **Ø**, $*g_1/*g_2 > k$ (Narageregeje 1982: 67-68);
- Koyo C24: $*k_1 > k$, **Ø**; $*g_1 > k$; $*k_2/*g_2 > g$ (Narageregeje 1982: 32-33, 37-39);
- Proto-Ngiri C30 (not including C35): Motingea Mangulu (1996: 57ff.) reconstructs ***k*** as the reflex of PB $*k_{1/2}$ and $*g_{1/2}$ and observes that in individual C30 languages /***k***/ can undergo complete loss;
- Ntomba C35a: $*k_{1/2}$, $*g_1 > k$, **Ø**; $*g_2 > k$ (Rurangwa 1979: 34ff.);
- Bolia C35b: $*k_{1/2}$, $*g_{1/2} > k$, **Ø** (Rurangwa 1979: 61ff.);
- Proto-C40: Donzo Bunza Yugia (2015: 179, 210, 276, 280) reconstructs ***k*** as reflex of PB ***k*** and ***g*** both in C1 and C2 positions, with loss as a further development. The only C40 language still preserving a /***g***/ reflex of PB $*g_2$ (alongside the widespread /***k***/) is Pagibete C401 (Donzo Bunza Yugia 2015: 210);
- Based on a non-systematic perusal of available sources, it seems that in Topoke C53 (Harries 1955; Tassa Okombe-Lukumbu 1994) and Turumbu C54 (Chelo 1973) $*k_{1/2}$ and $*g_{1/2} > g$. Additionally, Topoke offers evidence that the /***g***/ reflex is a revoicing of an original /***k***/, because there are still some lexical items with /***k***/ both in C1 and C2;
- Upon quick inspection, the merger in both positions also seems to be present in Mongo C61 (Hulstaert 1952), Tetela C71 (Onawongo 1980), Dengese C81 (Goemaere 1984), Hendo C82 (Ngonga-kɛ́-Mbembe 2009), Lele C84 (Rutinigirwa 1975; Ngwamashi Kabandji-Bola Kamu 1979), Bushong C83 (Daeleman 1977) and Wonk C85 (Tete Wer Sey 1975).

Although the CWB overview presented above is far from exhaustive, it does indicate that the velar merger might be widespread within this major subclade. Only two pieces of evidence argue against reconstructing this innovation back to the most recent common ancestor of CWB: (1) a non-systematic perusal of data for the Bwa bloc (Boone & Olson 2004) a.k.a Bwa cluster C44 suggests that this cluster as well as Pagibete C401 have preserved the PB *k/*g contrast minimally in C1; (2) in some C10-20 languages, PB *k has a zero reflex, while PB *g does not, which could suggests *g > k only happened after *k > Ø and the partial merger of PB *k and *g is a later innovation.

3.3. Velar merger in NWB

Although NWB is not one single clade in Grollemund *et al.* (2015), we present here a short overview of the evidence we found in Guthrie's zone A and B referential groups considered to be NWB:

- Jarawan Bantu: Gerhardt (1982: 89-95) proposes *k instead of PB *g for several Proto-Jarawan Bantu (PJWB) roots, while PB *k most often corresponds to PJWB *k;
- Manenguba cluster A15: $*k_1 > Ø, k, w$ $*g_1 > k, g, Ø$; $*k_2 > g, Ø$, $*g_2 > g$ (Hedinger 2006: 109ff.);
- Bubi A31: $*k_{1/2}$, $*g_{1/2} > Ø, k$ with some intermediate fricative reflexes before complete loss (Janssens 1993: 25ff.); however, a quick glance at the data in Bolekia Boleká (2009) seems to support $*k_1 >$ Ø and $*g_1 >$ ʔ (the voiceless glottal stop being a lenition of k).
- Basaa A43a: $*k_1$,$*g_1 > k$, Ø; $*k_2 > k$, Ø and $*g_2 > k$ (Janssens 1982: 77ff.; Teil-Dautrey 1991: 38ff.);
- Nen A44: $*k_{1/2}$, $*g_{1/2} > k$, Ø (in equal proportions) (Janssens 1993: 67ff.);
- Bafia A53: $*k_1$, $*g_1 > k, ɣ$ or Ø; $*k_2$, $*g_2 > K$ or Ø (where K is a morphophoneme which can be realized as [ʔ], [ɣ] or [k] in final position, intervocalically, or before another consonant respectively) (Janssens 1993: 144ff.);
- Ewondo A72: $*k_1 > k$ (in the absence of a conditioning environment) and $*g_1 > k$ (Janssens 1993: 178ff.). In verbal roots, $*k_2$, $*g_2 > g$. In nominal roots (especially those reconstructed as HL), $*g_2 > g$ and $*k_2 > Ø, g$ (the latter reflex is extremely sporadical);
- Fang A75: $*k_{1/2}$, $*g_{1/2} > k$. In C2, the merged reflex /k/ has multiple additional reflexes including fricatives and zero depending on specific Fang varieties (Medjo Mvé 1997: 362ff.);
- A80 group: Cheucle (2008: 500) reports $*k_{1/2}$, $*g_{1/2} > k$;
- Kwakum A91: The data in Njantcho Kouagang (2018) also point towards $*k_{1/2}$, $*g_{1/2} > k$;
- B10-30: no dedicated study is available but judging from a non-systematic perusal of wordlists and lexicons, a merger like the one we posited for PWCB seems to have taken place also in B11 (Jacquot 1976), B20 (see Piron 1990 on B25 and Mokrani 2016 on B20 in general) and B30 (van der Veen 1991). B10 and B30 both developed fricatives as further developments of /k/ as the merged reflex of PB *k and *g in C2. B11 offers evidence for a chain of changes such as $k_2 > g > ɣ$ (Jacquot 1976: 25).

In all instances described thus far in this subsection, one could posit a lenition chain such as the one in (21) where not all stages are synchronically attested in all languages – this is indicated by parentheses in (21) – or not all lexical items in a language underwent the entire chain of changes. This chain might have taken place either in C1 or C2 or both. For a similar chain of changes in some zone A languages, see Janssens (1993: 27, 228).

(21) PB ***k/*g** > **k** > (**g**) > (velar fricative) > (**w**) > (**ʔ**) > Ø

It appears that common velar fricatives as reflexes of PB velars in the northwestern area (including WCB see also zone C below) are /***ɣ***/, /***x***/, /***ʁ***/ and /***h***/, though /***ʁ***/ appears exclusively in WCB. The revoicing of /***k***/ as an additional step in the lenition chain in (21) is based on Ewondo A72 data, and is confirmed by at least Myene B11 and Topoke C53.

At first glance, the NWB overview presented above does not seem to provide any conclusive evidence for a NWB language *not* having merged PB ****k*** and ****g***, except maybe Bubi A31. The only evidence possibly pointing towards the velar merger as a later innovation is the fact that PB ****k*** sometimes shifts to zero, while PB ****g*** does not.

However, this picture might be just the result of obsolete or incomplete documentation. Drawing on a wealth of unpublished data and on profound knowledge of zone A languages, Gérard Philippson (pers. comm.) argues that in all zone A languages mentioned in this section (with the exclusion of Jarawan Bantu), the regular reflex of ****k***$_1$ is ***Ø*** and the regular reflex of ****g***$_1$ is /**k**/. Other alleged reflexes of ****k***$_1$ and ****g***$_1$ in each of these languages are extremely limited in number and/or attributable to unnoticed conditioning environments. One such often unnoticed conditioning factor is the underlying homorganic class 9/10 prefix, especially common in plant and animal names. For instance, /**k**/ is often seen as a reflex of ****k***$_1$ when in fact it is a reflex of ****ŋk***$_1$. To give an example, Proto-Manenguba A15 ****kém*** 'monkey' is not a reflex of BLR 1798 ****kímà*** as Hedinger (2006: 109) suggests, but of ****ŋ-kímà***, where the homorganic noun class 9 prefix got lost (as is common in Bubi, see Kerremans 1980). Another explanation for multiple unconditioned reflexes pointing to apparent mergers between ****g***$_1$ and ****k***$_1$ could be undetected loanwords from surrounding areas into zone A. For example, many zone A attestations of the BLR 4998 ****kùgú*** root (class 3/4) for 'sugarcane' have an initial /**k**/ as the irregular reflex of ****k***, because they were borrowed from outside the region (see for example Hedinger 2006: 215 for Manenguba A15). Other unconditioned reflexes such as velar fricatives and glides in C1 position in these zone A languages can be explained as synchronic strategies to fill in empty syllable onsets created by the loss of ****k***$_1$. The same would happen in several zone A groups with empty onsets due to the loss of other PB C1 consonants, such as ****p***, ****d*** and ****j***.

This alternative hypothesis, albeit unpublished, is of enormous importance for the questions set forth in the introduction of this paper and further discussed in §4. If proven to be correct by means of a systematic study, this hypothesis would indicate that the evolution of PB velars in (minimally) C1 position in most languages within NWB (i.e. ****k***$_1$ > Ø and ****g***$_1$ > ***k***) is different from the one found in WCB (i.e. ****k***$_1$/***g***$_1$ > ***k***). In this respect, Gérard Philippson (pers. comm.) proposes the existence of two

groups based on the distinct evolution of PB velars in C1 position. One group would be defined by the loss of *$\mathbf{k}_1$ and the devoicing of *$\boldsymbol{g}_1$ > $\boldsymbol{k}$ and would cover most of Guthrie's zone A (except the Sanaga A60 languages and perhaps the Eastern Mbam languages A44-46), several B20 languages, an unknown amount of zone C, and even a few zone D languages. The second group would be WCB, defined by the fortition of PB *$\boldsymbol{g}_1$ > $\boldsymbol{k}$ and its merger with PB *$\boldsymbol{k}_1$. This group might incorporate zone C languages attesting this innovation but not being part of WCB from a lexicon-based phylogenetic point of view. These subgroups for the northwestern Bantu area would be entirely at variance with the "Forest" group of Nurse and Philippson (2003).

4. Discussion and conclusions

The devoicing of PB *$\boldsymbol{g}$ was known to have a widespread distribution in the northwestern part of the Bantu domain. The systematic historical-comparative study of this sound change within WCB and the wide-ranging review of diachronic phonological literature outside WCB confirms that *$\boldsymbol{g}$ > $\boldsymbol{k}$ occurs indeed in Guthrie's zones "A, B, C, large parts of H, and most (how much?) of D10-20-30" (Nurse & Philippson 2003: 177). The frequency of the sound shift PB *$\boldsymbol{g}$ > $\boldsymbol{k}$ in WCB and other western Bantu languages probably does explain why the BLR database contains 1448 entries with *$\boldsymbol{k}$ in C1 vs. only 648 entries with a *$\boldsymbol{g}$ in C1 and 783 with *$\boldsymbol{k}$ in C2 vs. 500 with *$\boldsymbol{g}$ in C2. The vast majority of reconstructions with *$\boldsymbol{g}$ have attestations in Eastern Bantu, a branch where the reflex of PB *$\boldsymbol{g}$ generally remained distinct from the one of PB *$\boldsymbol{k}$. Although we do not know the exact geographical spread and the affected phonotactic positions for the merger PB *$\boldsymbol{k}$/*$\boldsymbol{g}$ > $\boldsymbol{k}$, it seems that the greater number of reconstructions with *$\boldsymbol{k}$ might be at least in part geographically biased by this merger.

Even when the sound shift *$\boldsymbol{g}$ > $\boldsymbol{k}$ is allegedly widespread, we did not know to what extent this sound change led to a conflation between PB *$\boldsymbol{k}$ and *$\boldsymbol{g}$ and to which time depth in Bantu language history this merger of PB velar stops should be reconstructed. This is because thus far there has not been a systematic diachronic analysis of PB *$\boldsymbol{g}$ and *$\boldsymbol{k}$ in a well-established Bantu clade. The historical analysis presented here fills in this gap, at least partially, and reveals that the merger of PB *$\boldsymbol{k}$ and *$\boldsymbol{g}$ happened minimally at the stage of Proto-WCB. Unlike what one could be tempted to conclude from the distribution maps in Guthrie (1967: 74-75), the conflation of PB *$\boldsymbol{g}$ and *$\boldsymbol{k}$ when not preceded by a nasal is not only attested in Guthrie's groups B60-70-80, H10 and H40, but also in B40, B50 and H30. Until now the status of WCB as a distinct clade within the Bantu family has been solely based on quantitative studies relying on basic vocabulary. In this study, we provide, through the Comparative Method, a piece of non-lexical evidence confirming that WCB is indeed genealogically distinct from at least SWB and EB, i.e. those languages which split off from the Bantu family tree's central backbone after WCB in the phylogeny of Grollemund *et al.* (2015). The most recent common ancestor of both SWB and EB must have separated from the most recent common ancestor it shared with WCB and possibly other clades before the velar merger took place.

On the other hand, historical phonological evidence from other parts of the northwestern domain is deficient and lacks systematicity. Thus, we cannot

use this evidence to claim that the velar merger undisputably represents a unique shared innovation distinguishing WCB from other northwestern Bantu clades. Despite intriguing alternative hypotheses begging for further systematic historical-comparative testing (see §4.3), available sources do not rule out the possibility that the velar merger *might be* widespread in the clades labeled NWB and CWB in the latest lexicon-based phylogenetic classification of Grollemund *et al.* (2015). If the merger would be empirically proven to exist in CWB and NWB clades besides WCB, Occam's razor or the law of parsimony has it that this innovation should be reconstructed back to their most recent common ancestor. However, if one attempts to do so following the phylogeny of Grollemund *et al.* (2015), summarized in Figure 2 at the beginning of §3, one is actually confronted with a huge problem. One would need to reconstruct the innovation back to the top of the tree, which is impossible, as we have posited that the lower nodes (SWB and EB) did not undergo the velar merger. It would be hard to imagine that they reintroduced the voicing contrast or created one *ex novo*. However, if there were no Bantu-external Niger-Congo evidence for the reconstruction of a voicing contrast in the velar series, this would be no doubt the most economical hypothesis.[8]

For sure, the 'ladderized' topology of the tree in Grollemund *et al.* (2015), i.e. clades successively splitting off from the central backbone, is a common visual procedure in linguistic phylogenetics, which does not necessarily reflect a relative time axis. Sequences of clades should not be blindly read as the passage of time (cf. Omland *et al.* 2008: 863; cited in de Schryver *et al.* 2015: 137). Moreover, internal relationships within and between different clades in the northwestern part are not well-established, as can be inferred by the low probably rates of several nodes in the Bayesian consensus tree of Grollemund *et al.* (2015) (cf. Pacchiarotti *et al.* 2019: 177). Nonetheless, their phylogeny does confirm the 'late split' or 'east-out-of-the-west' model of Bantu Expansion, which emerged from earlier genealogical classifications (cf. Henrici 1973; Heine *et al.* 1977; Ehret 2001; Holden *et al.* 2005; Rexová *et al.* 2006) and which has recently found support in genetic studies (Alves *et al.* 2011; de Filippo *et al.* 2012; Patin *et al.* 2017). In contrast to the 'early split' or 'east separate from west' model (cf. Wiesmüller 1997; Pakendorf *et al.* 2011 for a more detailed discussion), the late split model does not see EB as a primary branch of the Bantu family whose ancestor reached Eastern Africa after a dispersal north of the rainforest, but as the latest branch that only rose after the southward expansion of Bantu languages through the rainforest.

Thinking in terms of language divergence, one can come up with only two possible solutions to this puzzle and none of them two is really satisfactory. The first one is that Nurse and Philippson (2003: 177) were right in positing that ***g** > **k*** is diagnostic of a huge "Forest Bantu" subgroup, which would include all NWB

8. Interestingly, an anonymous reviewer observes that the potential problem represented by the widespread distribution of PB ***g** > **k*** has a parallel in Eastern and South-Western Bantu. Across most languages of zones K, L, M, N, R, and S, PB ***g*** became zero, but not in zones E, F, and G. It is impossible to reconstruct a common ancestor for the innovative leniting languages taking the phylogenetic tree of Grollemund *et al*. (2015) as the point of departure. The reviewer argues that a convergence/contact scenario might instead account for the spread of this innovation.

clades of Grollemund *et al.* (2015) as well as CWB and WCB. However, this can only work within an 'early split' model of Bantu language dispersal for which there is little other evidence. Additionally, we do not know exactly what happened to ***k*** in NWB and CWB. New research could further invalidate the existence of a "Forest Bantu" subgroup given that the diachronic developments of PB ***k*** and ***g*** seem to have greater diagnostic power when considered in relation to one another rather than separately. The second one is that the 'late split' model is valid, in which case one has to posit that the velar merger happened recurrently as a parallel innovation in the northwestern area after SWB and EB had emerged south of the rainforest. The fact that certain peripheral rainforest languages, such as Pagibete C401 and possibly the Bwa cluster C44, did not undergo the merger and the fact that across NWB and CWB ***k*** often becomes zero while ***g*** becomes /***k***/ could indeed point towards the independent actuation of the devoicing of ***g**. On the other hand, even if the devoicing of ***g*** is arguably natural (see for example Maddieson 1984: 36-37), positing a series of independent developments in geographically contiguous areas is not so appealing. One wonders *why* the velar merger is actually so massively attested inside NWB, CWB and WCB but not outside. If this sound change really happened independently and recurrently within NWB, CWB and WCB, one would expect a patchier distribution, as is the case in EB and SWB.

An alternative possibility is that the devoicing of ***g*** and the subsequent velar merger should not be interpreted in terms of language divergence but rather in terms of language convergence. Its massive distribution inside NWB, CWB and WCB – as opposed to its near-absence outside of these clades – might be the outcome of a process of linguistic homogenization that happened after the initial diversification of the Bantu language family and that was induced by a common substrate. Certainly, such a scenario is highly speculative, because nearly impossible to substantiate with empirical evidence, but it has been proposed before. Möhlig (1981: 270) has actually been the first to come up with this hypothesis: "In most of the Forest languages, the sound shift ***g** → [-voice] (**g** → **k**) did not cause merger between ***g** and ***k**, because, at the time when ***g** became ***k**, the original ***k** had already shifted via the intermediate stages of [**x**] and [**h**] towards complete deletion. So, the sound shift ***g** → [-voice] re-introduced a sound which had previously disappeared in the phonological systems concerned. Such reversion of an inherent trend of sound shift (elimination of a voiceless velar plosive) generally indicates that *language shift between nonrelated or only loosely related languages must have taken place*" [our emphasis]. Möhlig mistakenly assumes here that the devoicing of ***g*** did not cause the velar merger in most rainforest Bantu languages. Nonetheless, still appealing is his hypothesis that the widespread distribution of ***g** > ***k*** could be evidence, possibly along with the peculiar structure of the vowel systems, for a "Rain Forest Pre-Bantu stratum", which is "more homogeneous than the modern Bantu languages in the Forest". Möhlig (1981: 270) does not further develop this idea, but he seems to suggest that ***g** > ***k*** could be a parallel innovation which rainforest Bantu languages independently underwent due to the substrate influence of languages already present before the arrival of Bantu languages and speech communities. In other words, autochthonous hunter-gatherers speaking a first language that was not Bantu would have shifted to one or more new Bantu languages and this shift would have

been significant enough to have had a structural and transgenerational influence on the phonology of the newly adopted language(s). Gérard Philippson (pers. comm.) has suggested to us that the unexpected fortition of ***g**$_1$* and ***g**$_2$* to /***k***/ and the merger of this /***k***/ with the already existing PB ****k*** in PWCB could indeed point to the articulatory habits of shifting speakers at the origin of a substratum. In support of this hypothesis is the observation that, at least in WCB, the velar merger not only happened in C2, but also in C1, while recent research has corroborated that a strong statistical universal exists for phonological neutralization targeting word-ends over beginnings (cf. Wedel *et al.* 2019). This would need further corroboration, however, preferably with reliable data from Bantu languages spoken by relic hunter-gatherer groups.[9]

Today, Central Africa still hosts hunter-gatherer communities which have a distinctive way of life and subsistence economy and are commonly considered to be descendants of the human populations settling in the rainforest before the arrival of Bantu speakers (Seitz 1970). Evolutionary genetic studies indeed show an ancient split between the ancestors of these hunter-gatherers and those of modern farmers, i.e. 60,000 to 70,000 years ago (Quintana-Murci *et al.* 2008; Patin *et al.* 2009; Batini *et al.* 2011). These studies also provide evidence for significant admixture between hunter-gatherer and neighboring populations (Quintana-Murci *et al.* 2008; Pakendorf *et al.* 2011). The fact that in contrast to Southern Africa, Central African hunter-gatherers no longer have one or more distinct language families indicates that historical interaction with newcomer groups did have an impact on their languages. Linguistically, they are assumed to have abandoned, in times unknown to history, their ancestral languages for those of one of the many immigrant groups (Bahuchet 2012). The overall majority of present-day Central African hunter-gatherer groups speaks a Bantu language, some an Ubangian language (disputably Niger-Congo), such as the Baka from Cameroon, Gabon, Congo and the Central African Republic, or a Central-Sudanic language (Nilo-Saharan), such as the Mbuti from the Ituri region in the DRC. If the contact with newcomers had such a dramatic impact on the languages of hunter-gatherer groups, it is not unimaginable that the large-scale integration of hunter-gatherers into rainforest Bantu speech communities also had an impact on the structure of their Bantu languages. Whether this pre-Bantu stratum was as uniform as Möhlig (1981: 270) suggests is impossible to say. However, if this contact-induced innovation repeatedly happened at an ancestral stage, i.e.

9. Bonny Sands (pers. comm.) suggests that if the velar merger came about through hunter-gatherers adopting one or more ancestral Bantu languages, then perhaps they were shifting from a language whose only voiced stops were labial and coronal implosives, but no velar implosives which are crosslinguistically much rarer because disfavored from an articulatory point of view (cf. Maddieson 1984: 120). These hunter-gatherers may have had a system with ***ɓ***, ***ɗ*** for the voiced series and ***p***, ***t***, ***k*** for the voiceless, whether aspirated or not, but in any event plosive because voiceless implosive are extremely rare universally (cf. Maddieson 1984: 27). If so, then [***g***] and [***k***] would have sounded more or less like the same consonant to them and this may have favored their merger. Although first-hand phonetic evidence for the implosive realization of the voiced stops /***b***/ and /***d***/ is missing, they have been sporadically reported in WCB (cf. Kibwenge India'Ane 1985: 43; Marchal-Nasse 1989: 6, 27). More dedicated phonetic research would be most welcome to test this hypothesis.

before a specific clade spread over its current distribution area, one can easily conceive how it reached such a huge geographical extent. This might explain why the distribution of the velar merger is at odds with the lexicon-based phylogeny and crosscuts different rainforest Bantu clades. As far as WCB is concerned, such intensive language contact with non-Bantu-speaking hunter-gatherers may have taken place in the homeland area between the Kamtsha and Kasai Rivers before speakers of ancestral WCB languages started to migrate towards the Atlantic Ocean. This hypothesis is difficult to test with linguistic data, but new genetic data from the WCB homeland region may shed new light on this question.

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References

Alves, I., Coelho, M., Gignoux, C., Damasceno, A., Prista, A. & Rocha, J. 2011. 'Genetic Homogeneity across Bantu-Speaking Groups from Mozambique and Angola Challenges Early Split Scenarios between East and West Bantu Populations'. *Human Biology* 83: 13-38.

Bahuchet, S. 2012. 'Changing language, remaining Pygmy'. *Human Biology* 84: 11-43.

Bastin, Y., Coupez, A. & Mann, M. 1999. *Continuity and Divergence in the Bantu Languages: Perspectives from a Lexicostatistic Study.* Tervuren: Royal Museum for Central Africa.

Bastin, Y., Coupez, A. Mumba, E. & Schadeberg, T.C. (eds). 2002. *Bantu Lexical Reconstructions 3*. Tervuren: Royal Museum for Central Africa, online database: linguistics.africamuseum.be/BLR3.html (last accessed 28 November, 2017).

Batini, C., Lopes, J., Behar, D.M., Calafell, F., Jorde, L.B., van der Veen, L. Quintana-Murci, L., Spedini, G., Destro-Bisol, G. & Comas, D. 2011. 'Insights into the demographic history of African Pygmies from Complete Mitochondrial Genomes'. *Mol. Biol. Evol.* 28: 1099-1110.

Bissila, S. 1991. 'Description phonologique du ilaale (dialecte teke du Congo)'. Mémoire de Diplôme d'Études Supérieures, Université Marien Ngouabi, Brazzaville.

Biton, A. 1969. *Dictionnaire ndumu-mbede-français et français-ndumu-mbede. Petite flore de la région de Franceville (Gabon). Grammaire ndumu-mbede*. Bar-le-Duc: Imprimerie St-Paul pour l'Archevêché de Libreville.

Blanchon, J.A. 2008. 'Dictionnaire punu'. Ms. Lyon, Université Lumière - Lyon 2, DDL - Dynamique Du Langage UMR 5596.

Blust, R. 1996. 'The Neogrammarian Hypothesis and Pandemic Irregularity'. In M. Durie & M. Ross (eds), *The Comparative Method Reviewed: Regularity and Irregularity in Language Change*. Oxford: Oxford University Press, pp. 135-156.

Bolekia Boleká, J. 2009. *Diccionario español-bubi = Ë ribúkku ra balláa béböbé-lëepanná*. Madrid: Akal.

Boone, D.W. & Olson, K.S. 2004. *Bwa bloc survey report*. SIL International.

Bostoen, K. 2008. 'Bantu Spirantization: Morphologization, Lexicalization and Historical Classification'. *Diachronica* 25: 299-356.

Bostoen, K. & Bastin, Y. 2016. Bantu Lexical Reconstruction. In *Oxford Handbooks Online*. Oxford: Oxford University Press, https://www.oxfordhandbooks.com/view/10.1093/oxfordhb/9780199935345.001.0001/oxfordhb9780199935345-e-36.

Bostoen, K., Clist, B., Doumenge, C., Grollemund, R., Hombert, J.-M., Koni Muluwa, J. & Maley, J. 2015. 'Middle to Late Holocene Paleoclimatic Change and the Early Bantu Expansion in the Rain Forests of West Central-Africa'. *Current Anthropology* 56: 354-384.

Bostoen, K. & de Schryver, G.-M. 2018a. 'Langues et évolution linguistique dans le royaume et l'aire kongo'. In B. Clist, P. de Maret & K. Bostoen (eds), *Une archéologie des provinces septentrionales du royaume Kongo*. Oxford: Archaeopress, pp. 51-55.

Bostoen, K. & de Schryver, G.-M. 2018b. 'Seventeenth-Century Kikongo Is Not the Ancestor of Present-Day Kikongo'. In K. Bostoen & I. Brinkman (eds), *The Kongo Kingdom: The Origins, Dynamics and Cosmopolitan Culture of an African Polity*. Cambridge: Cambridge University Press, pp. 60-102.

Bostoen, K. & Goes, H. 2019. 'Was Proto-Kikongo a 5 or 7 Vowel Language? Bantu Spirantization and Vowel Merger in the Kikongo Language Cluster'. *Linguistique et langues africaines* 5: 25-68.

Burssens, N. 1999. *Dictionnaire français-buma*. Bandundu: Centre d'Études Ethnologiques de Bandundu.

Campbell, L. 2004. *Historical Linguistics: An Introduction (Second Edition)*. Cambridge, Massachusetts: The MIT Press.

Chelo, L. 1973. 'Phonologie et morphologie de la langue olombo (turumbu)'. Mémoire de licence, Université nationale du Zaïre, Lubumbashi.

Cheucle, M. 2008. 'Vers une description de la langue bekwel (A85b) du Gabon : approche synchronique, approche diachronique'. Mémoire de master, Université Lumière Lyon 2, Lyon.

Coupez, A., Bastin, Y. & Mumba, E. (eds) 1998. *Reconstructions lexicales bantoues 2/Bantu lexical reconstructions 2 (electronic database)*. Tervuren: Musée royal de l'Afrique centrale.

Crane, T.M., Hyman, L.M. & Nsielanga Tukumu, S. 2011. *A Grammar of Nzadi (B865) A Bantu Language of the Democratic Republic of Congo with an Appendix of Proto-Bantu - Nzadi Sound Correspondences by Clara Cohen*. Berkeley: University of California Publications.

da Silva Maia, A. 1961. *Dicionário complementar português-kimbundu-kikongo, linguas nativas do centro e norte de Angola*. Cucujães (Angola): Tipografia das Missões.

Daeleman, J. 1977. 'A Comparison of Some Zone B Languages in Bantu'. *Africana Linguistica* 7: 93-144.

Daeleman, J. 1983. 'Les réflexes du proto-bantu en ntandu (dialecte koongo)'. In C. Faïk-Nzuji Madiya & E. Sulzmann (eds), *Mélanges de culture et de linguistique africaines publiés à la mémoire de Leo Stappers*. Berlin: Dietrich Reimer Verlag, pp. 331-397.

Daeleman, J. s.d. Kikoóngo wordlists classified according to their respective tones. Ms.

de Filippo, C., Bostoen, K., Stoneking, M. & Pakendorf, B. 2012. 'Bringing Together Linguistic and Genetic Evidence to Test the Bantu Expansion'. *Proceedings of the Royal Society B (Biological Sciences)* 279: 3256-3263.

De Grauwe, J. 2009. *Lexique yoómbe-français, avec index français-yoómbe (bantu H16c)* (Tervuren Series for African Language Documentation and Description). Tervuren: Royal Museum for Central Africa.

de Schryver, G.-M., Grollemund, R., Branford, S. & Bostoen, K. 2015. 'Introducing a State-of-the-Art Phylogenetic Classification of the Kikongo Language Cluster'. *Africana Linguistica* 21: 87-162.

De Witte, P. 1955. *Taalstudie bij de Basakata*. Tervuren: Koninklijk Museum van Belgisch-Congo.

Dibata Mimpiya, I. 1977. 'Le substantif mbuun: étude d'une forme nominale'. Travail de fin d'études de graduat, Université de Lubumbashi, Lubumbashi.

Donzo Bunza Yugia, J.-P. 2015. 'Langues bantoues de l'entre Congo-Ubangi (RD Congo): documentation, reconstruction, classification et contacts avec les langues oubanguiennes'. PhD thesis, Université de Gand (UGent), Gand.

Dunn, M. 2014. 'Language Phylogenies'. In C. Bowern & B. Evans (eds), *The Routledge Handbook of Historical Linguistics*. London: Routledge, pp. 190-211.

Ebalantshim Masuwan. 1980. 'Esquisse grammaticale de la langue idiŋ à Káantsa'. M.A., Université Nationale du Zaïre, Lubumbashi.

Ehret, C. 2001. 'Bantu Expansions: ReEnvisioning a Central Problem of Early African History'. *The International Journal of African Historical Studies* 34: 5-27.

Ellington, J.E. 1977. 'Aspects of the Tiene Language'. PhD thesis, University of Wisconsin, Madison.

François, A. 2014. 'Trees, waves and linkages: models of language diversification'. In C. Bowern & B. Evans (eds), *The Routledge Handbook of Historical Linguistics*. London: Routledge, pp. 161-189.

Gerhardt, L. 1982. 'Jarawan Bantu: The Mistaken Identity of the Bantu Who Turned North'. *Afrika und Übersee* 65: 75-95.

Goemaere, A. 1984. *Grammaire du londengese*. Bandundu: Centre d'Études Ethnologiques de Bandundu.

Grégoire, C. 2003. 'The Bantu Languages of the Forest'. In D. Nurse & G. Philippson (eds), *The Bantu Languages*. London New York: Routledge, pp. 349-370.

Grollemund, R., Branford, S., Bostoen, K., Meade, A., Venditti, C. & Pagel, M. 2015. 'Bantu Expansion Shows That Habitat Alters the Route and Pace of Human Dispersals'. *Proceedings of the National Academy of Sciences of the United States of America* 112: 13296-13301.

Guthrie, M. 1967. *Comparative Bantu: An Introduction to the Comparative Linguistics and Prehistory of the Bantu languages. Volume 1: The Comparative Linguistics of the Bantu Languages*. London: Gregg International.

Guthrie, M. 1971. *Comparative Bantu: An Introduction to the Comparative Linguistics and Prehistory of the Bantu languages. Volume 2: Bantu Prehistory, Inventory and Indexes*. London: Gregg International.

Harries, L. 1955. 'Grammar of Gesogo'. *Kongo-Overzee* 21: 420-440.

Hedinger, R. 2006. *The Manenguba languages (Bantu A15, Mbo cluster) of Cameroon*. London; New York: Routledge.

Heine, B., Hoff, H. & Voßen, R. 1977. 'Neuere Ergebnisse zur Territorialgeschichte der Bantu'. In W.J.G. Möhlig, F. Rottland & B. Heine (eds), *Zur Sprachgeschichte und Ethnohistorie in Afrika*. Berlin: Dietrich Reimer, pp. 52-72.

Henrici, A. 1973. 'Numerical Classification of Bantu Languages'. *African Language Studies* 14: 82-104.

Holden, C.J., Meade, A. & Pagel, M. 2005. 'Comparison of Maximum Parsimony and Bayesian Bantu Language Trees'. In R. Mace, C.J. Holden & S. Shennan (eds), *The Evolution of Cultural Diversity: a Phylogenetic Approach.* London: UCL Press, pp. 53-65.

Hombert, J.-M. & Mouélé, M. 1988. 'Éléments de phonologie diachronique du wanzi (langue bantu du Gabon, groupe B50)'. *Pholia* 3: 183-205.

Hulstaert, G. 1952. *Dictionnaire français-lomongo (lonkundo)*. Tervuren: Musée royal du Congo belge.

Idiata-Mayombo, D.F. 1993. 'Éléments de phonologie diachronique du isangu (B42)'. *Pholia* 8: 67-108.

Impubi Mukwa, M. 1987. 'Le syntagme nominal en yans B85d. Parler de Mikingi Kiakia - Collectivité de Nkara/Niadi'. Travail de fin d'études, Institut Supérieur Pédagogique de Kikwit, Kikwit.

Jacquot, A. 1976. 'Étude de phonologie et de morphologie myene'. In A. Jacquot, A.E. Meeussen & C. Grégoire (eds), *Études bantoues II*. Paris: SELAF, pp. 13-78.

Janssens, B. 1982. 'Phonologie historique du basaa (bantou A43)'. Mémoire de licence, Université libre de Bruxelles, Bruxelles.

Janssens, B. 1993. 'Doubles réflexes consonantiques : quatre études sur le bantu de zone A (bubi, nen, bafia, ewondo)'. PhD thesis, Université libre de Bruxelles, Bruxelles.

Kabange Mukala, E. 2009. 'Éléments de transition linguistique entre les zones L et M du bantu: parenté et affinité'. PhD thesis, Université de Lubumbashi, Lubumbashi.

Kanyamibwa, M. 1982. 'Confrontation historique du lexique du protobantu avec le cokwe (zone K), le sanga (zone L) et le rwanda (zone J)'. Mémoire de licence, Université nationale du Rwanda, Ruhengeri.

Kashika Katanga. 1990. ‘Phonologie historique de la langue holu’. Travail de fin d’études, Institut Supérieur Pédagogique de Lubumbashi, Lubumbashi.
Kerremans, R. 1980. ‘Nasale suivie de consonne sourde en protobantu’. *Africana Linguistica* 8: 159-198.
Khang Levy, N.-m.s. 1979. ‘Éléments de grammaire morphologique de la langue lwel’. Mémoire de licence, Université Nationale du Zaïre, Lubumbashi.
Kibwenge India’Ane, P. 1985. ‘Langue mpur B85e. Phonologie et morphologie synthématique : parler de Mikingi, collectivité Dwe’. Mémoire de licence, ISP de Kikwit, Kikwit.
Kitoko Mufanga, D. 1978. ‘Contribution à la phonologie ding’. Travail de fin de cycle de graduat, Université nationale du Zaïre, Lubumbashi.
Koni Muluwa, J. 2010. ‘Plantes, animaux et champignons en langues bantu. Étude comparée de phytonymes, zoonymes et myconymes en nsong, ngong, mpiin, mbuun et hungan (Bandundu, RD Congo)’. PhD thesis, Université libre de Bruxelles, Bruxelles.
Koni Muluwa, J. 2014. *Noms et usages de plantes, animaux et champignons chez les Mbuun, Mpiin, Ngong, Nsong et Hungan en RD Congo* (Tervuren Series for African Language Documentation and Description). Tervuren: Musée royal de l’Afrique centrale.
Koni Muluwa, J. 2015a. Lexicon English-French-Ngong (Kwenge dialect). Ms. Ghent, Ghent University, - DoBes Kwilu Bantu project, http://www.kwilubantu.ugent.be
Koni Muluwa, J. 2015b. Petit lexique français-anglais-nsambaan (parlers de Kikongo et Kwilumpia) nsambaan-français-anglais. Ms. Gand, Université de Gand, projet DoBes Kwilu Bantu, http://www.kwilubantu.ugent.be
Koni Muluwa, J. & Bostoen, K. 2015. *Lexique comparé des langues bantu du Kwilu (République démocratique du Congo)*. Cologne: Rüdiger Köppe.
Laman, K.E. 1912. *Grammar of the Kongo Language (Kikongo)*. New York: Christian Alliance Publishers.
Laman, K.E. 1936. *Dictionnaire kikongo-français, avec une étude phonétique décrivant les dialectes les plus importants de la langue dite kikongo*. Bruxelles: Librairie Falk.
Laman, K.E. & Meinhof, C. 1928-29. ‘An essay in Kongo phonology’. *Zeitschrift für Eingeborenen-Sprachen* 19: 12-40.
Lane, B.D. 1989. ‘Toward Understanding Multilingualism Among the Mbete of Northern Congo’. MA thesis, University of Texas, Arlington.
Loubelo, F. 1987. ‘Description phonologique du itsaangi, parler de Madouma Mossendjo’. Mémoire de D.E.S, Université Marien Ngouabi, Libreville.
Loubelo, F. 1990. ‘Le nom en kitsa:ngi : langue bantoue du Congo’. Thèse pour le doctorat de 3e cycle, Université Cheikh Anta Diop, Dakar.
Mabiala, J.-N.N. 1999. Phonologie comparative et historique du kongo (groupe H10).
Maddieson, I. 1984. *Patterns of sounds*. Cambridge: Cambridge University Press.
Maho, J.F. 2009. NUGL Online: The Online Version of the New Updated Guthrie List, a Referential Classification of the Bantu Languages (4 Juni 2009). (Online file: http://goto.glocalnet.net/mahopapers/nuglonline.pdf

Makouta-Mboukou, J.-P. 1969. *Vocabulaire fumu-français*. Brazzaville: Centre d'Enseignement Supérieur de Brazzaville (polycopié).

Makouta-Mboukou, J.-P. 1976. '*Étude descriptive du fumu, dialecte teke de Ngamaba, Brazzaville*'. Thèse de doctorat d'état, Paris III, Sorbonne Nouvelle, Paris.

Mangulu, A.M. 2004. 'Divergences en dialectes tiene (bantou B81): origine disparate ou perte séparée d'identité linguistique?' *Annales Aequatoria* 25: 151-202.

Marchal-Nasse, C. 1989. 'De la phonologie à la morphologie du nzebi, langue bantoue (B52) du Gabon'. Thèse de doctorat, Université libre de Bruxelles, Bruxelles.

Mavoungou, P.A. & Plumel, B. 2010. *Dictionnaire yilumbu-français*. Libreville: Éditions Raponda Walker.

Mayanga, T. 1985. *Grammaire yansi (Rép. du Zaïre)*. Bandundu Centre d'Études Ethnologiques de Bandundu.

Medjo Mvé, P. 1989. 'Exploration morphosyntaxique du dialecte le nyani ou contribution à l'étude du verbe ndumu'. Mémoire de maîtrise, Université Omar Bongo, Libreville.

Medjo Mvé, P. 1997. 'Essai sur la phonologie panchronique des parlers fang du Gabon et ses implications historiques'. PhD thesis, Université Lumière-Lyon2, Lyon.

Meeussen, A.E. 1967. 'Bantu Grammatical Reconstructions'. *Africana Linguistica* 3: 79-121.

Meinhof, C. 1899. *Grundriß einer Lautlehre der Bantusprachen nebst Anleitung zur Aufnahme von Bantusprachen - Anhang : Verzeichnis von Bantuwortstämmen.* Leipzig: F.A. Brockhaus.

Mickala-Manfoumbi, R. 1988. 'Éléments de description du duma, langue bantu du Gabon (B51)'. Mémoire de licence spéciale, Université libre de Bruxelles, Bruxelles.

Möhlig, W.J.G. 1981. 'Stratification in the History of the Bantu Languages'. *Sprache und Geschichte in Afrika*: 251-317.

Mokrani, S. 2016. 'Étude comparée des parlers du groupe bantu kota-kele (B20) du Gabon: À la recherche de nouveaux critères classificatoires'. PhD thesis, Université Lumière-Lyon 2, Lyon.

Motingea Mangulu, A. 1996. *Étude comparative des langues ngiri de l'entre Ubangi-Zaïre* (CNWS publications 43). Leiden: Research School CNWS.

Mouandza, J.D. 2001. 'Éléments de description du iyaa (parler bantu du Congo-Brazzaville)'. PhD thesis, Université de Nice Sophia Antipolis, Nice.

Mouélé, M. 1997. '*Étude synchronique et diachronique des parlers dúmá (groupe bantu B50)*'. PhD thesis, Université Lumière Lyon 2, Lyon.

Mula, E. 1977. 'Esquisse de grammaire kiding munken : phonologie et morphologie (parler de Bantsiona)'. Mémoire de licence, Université Nationale du Zaïre, Lubumbashi.

Mulindabigwi, E. 1981. 'Confrontation historique de la phonologie et du lexique rund avec le protobantu et deux langues contemporaines: sanga et rwanda'. Mémoire de licence, Université nationale du Rwanda, Butare.

Mundeke, L. 1979. ‘Esquisse grammaticale de la langue mbúún (parler de Éliob)’. Mémoire de licence, Université Nationale du Zaïre, Lubumbashi.
Mundeke, L. 2011. ‘Étude morphosyntaxique de la langue mbuun (B87) (parler d’Elyob)’. Université de Lubumbashi, Lubumbashi.
Munkyen Okab, S.L. 1990. ‘Étude contrastive phonetico-phonologique entre le français et le ding B86’. PhD thesis, Université de la Sorbonne Nouvelle Paris III, Paris.
Mwan Mesongolo, M. 1984. ‘Phonologie et morphologie de kedeŋ-Lesye (B86). Parler de Mateko-Mfwaay’. Mémoire de licence, Université Nationale du Zaïre, Lubumbashi.
Narageregeje, E. 1982. ‘Confrontation historique des lexiques de trois langues bantoues (leke, ngombe, koyo) de la zone C avec le protobantu et le rwanda’. Mémoire de licence, Université nationale du Rwanda, Ruhengeri.
Narciso Cobe, F. 2010. *Novo Dicionário Português-Kikongo*. Luanda: Mayamba.
Ndouli, G.B. 2001. ‘Description phonologique du mbere: parler de Tsama’. Mémoire de maîtrise, Université Marien Ngouabi, Brazzaville.
Ngonga-kɛ́-Mbembe, H. 2009. ‘Langage initiatique Ohendo : phonologie et métaphonologie des langues dérivées’. PhD thesis, Radboud Universiteit, Nijmegen.
Nguma, W. 1986. *Dictionnaire français-yansi (Rép. du Zaïre)* (Série III 14). Bandundu: CEEBA.
Ngwamashi Kabandji-Bola Kamu, E. 1979. ‘Equisse morphologique du luhilel: formes nominales et pronominales’. Travail de fin d’études, Université Nationale du Zaïre, Kinshsasa.
Njantcho Kouagang, E. 2018. ‘A Grammar of Kwakum’. PhD dissertation, INALCO, Paris.
Nkouanda, B.P. 1997. ‘Description phonologique du kiga:ngala, parler bantou du Congo (Groupe H)’. Mémoire de maîtrise, Université Marien Ngouabi, Brazzaville.
Ntitenguha, F.-X. 1984. ‘Confrontation historique de la phonologie et du lexique pende avec le protobantu et deux langues bantoues contemporaines: rwanda et sanga’. Mémoire de licence, Université nationale du Rwanda, Butare.
Nurse, D. & Philippson, G. 2003. ‘Towards a Historical Classification of the Bantu Languages’. In D. Nurse & G. Philippson (eds), *The Bantu Languages*. London; New York: Routledge, pp. 164-181.
Okoudowa, B. 2016. *Morfologia verbal do Lèmbáámá: Língua banta falada no Gabaõ (África Central)*. Saarbrücken: Novas Edições Acadêmicas.
Omland, K.E., Cook, L.G. & Crisp, M.D. 2008. ‘Tree thinking for all biology: The problem with reading phylogenies as ladders of progress’. *BioEssays* 30: 854-867.
Onawongo, E.A.O. 1980. ‘Esquisse grammaticale de la langue tetela C71 (parler de Loja): phonologie et morphologie’. Mémoire de licence, Université de Lubumbashi, Lubumbashi.
Pacchiarotti, S., Chousou-Polydouri, N. & Bostoen, K. 2019. ‘Untangling the West-Coastal Bantu Mess: Identification, Geography and Phylogeny of the Bantu B50-80 Languages’. *Africana Linguistica* 25: 155-229.

Pakendorf, B., Bostoen, K. & de Filippo, C. 2011. 'Molecular Perspectives on the Bantu Expansion: A Synthesis'. *Language Dynamics and Change* 1: 50-88.

Patin, E., Laval, G., Barreiro, L.B., Salas, A., Semino, O., Santachiara-Benerecetti, S., Kidd, K.K., Kidd, J.R.,Van der Veen, L., Hombert, J.M., Gessain, A., Froment, A., Bahuchet, S., Heyer, E. & Quintana-Murci, L. 2009. 'Inferring the demographic history of African farmers and pygmy hunter-gatherers using a multilocus resequencing data set [Apr]'. *PLoS Genet* 5: e1000448.

Patin, E., Lopez, M., Grollemund, R., Verdu, P., Harmant, C., Quach, H., Laval, G., Perry, G.H., Barreiro, L.B., Froment, A., Heyer, E., Massougbodji, A., Fortes-Lima, C. F. Migot-Nabias, G. Bellis, J.-M. Dugoujon, J.B. Pereira, V. Fernandes, L. Pereira, L. Van der Veen, P. Mouguiama-Daouda, C.D. Bustamante, J.-M. Hombert & Quintana-Murci, L. 2017. 'Dispersals and Genetic Adaptation of Bantu-Speaking Populations in Africa and North America'. *Science* 356: 543-546.

Paulian, C. 1975. *Le kukuya, langue teke du Congo: phonologie-classes nominales*. Paris: Société des Études Linguistiques et Anthropologiques.

Philippson, G. & Grollemund, R. 2019. 'Classifying Bantu Languages'. In M. Van de Velde, K. Bostoen, D. Nurse & G. Philippson (eds), *The Bantu Languages (Second Edition)*. Oxford: Routledge, pp. 335-354.

Piron, P. 1990. 'Eléments de description du kota, langue bantoue du Gabon, B25'. Bruxelles: Université libre de Bruxelles, mémoire de licence spéciale.

Pokoso, K.-K. 1986. *Essai d'anthroponymie ngongo (parler Lukula sud)*. Mémoire de licence, Institut Supérieur Pédagogique de Kikwit, Kikwit.

Quintana-Murci, L., Quach, H., Harmant, C., Luca, F., Massonnet, B., Patin, E., Sica, L. Mouguiama-Daouda, P., Comas, D., Tzur, S., Balanovsky, O., Kidd, K.K., Kidd, J.R., van der Veen, L., Hombert, J.M., Gessain, A., Verdu, P., Froment, A., Bahuchet, S., Heyer, E., Dausset, J., Salas, A. & Behar, D.M.. 2008. 'Maternal Traces of Deep Common Ancestry and Asymmetric Gene Flow between Pygmy Hunter-Gatherers and Bantu-Speaking Farmers [Feb 5]'. *Proc Natl Acad Sci U S A* 105: 1596-1601.

Raharimanantsoa, R. 2012a. 'Aspects of phonology in Eboo-Nzikou (Bantu B74)'. Gothenburg: University of Gothenburg, preparatory research course paper.

Raharimanantsoa, R. 2012b. 'Processes of vowel change due to second consonant loss in Boma-Nzikou (Bantu B74) '. Paper presented at the 42nd Colloquium on African Languages and Linguistics, University of Leiden.

Raharimanantsoa, R. 2016. 'Réduction syllabique, rallongement compensatoire et syllabes trimoraïques en engungwel (bantou B72a)'. *Journal of West African Languages* 43: 61-98.

Raharimanantsoa, R. 2017. 'The prosody of tense marking in Teke-Eboo: A Bantu B70 language of Congo-Brazzaville'. MA thesis, Gothenburg University, Gothenburg.

Rexová, K., Bastin, Y. & Frynta, D. 2006. 'Cladistic Analysis of Bantu Languages: A New Tree Based on Combined Lexical and Grammatical Data'. *Naturwissenschaften* 93: 189-194.

Rottland, F. 1977. 'Reflexes of Proto-Bantu Phonemes in Yanzi (B85)'. *Africana Linguistica* 7: 375-396.

Rugigana, S. 1982. 'Confrontation historique du lexique de trois langues de la zone D (mituku, lega et holoholo) avec le protobantu et le rwanda'. Mémoire de licence, Université nationale du Rwanda, Ruhengeri.

Rurangwa, I.M. 1979. 'Problèmes historiques de phonologie et de lexique de la zone C en rapport avec le rwanda et le sanga'. Mémoire de licence, Université nationale du Rwanda, Butare.

Rurangwa, I.M. 1982. '*Éléments de description du ngungwel, langue bantoue du Congo*'. Mémoire de licence, Université Libre de Bruxelles, Bruxelles.

Rutinigirwa, K. 1975. 'Esquisse grammaticale de la langue lele'. Mémoire de licence, Université nationale du Zaïre, Lubumbashi.

Ruttenberg, P. 2000. *Lexique yaka-francais, français-yaka* (Languages of the World Dictionaries). München: Lincom Europa.

Schadeberg, T.C. 1995. 'Spirantization and the 7-to-5 Vowel Merger in Bantu'. *Belgian Journal of Linguistics* 9: 71-84.

Seitz, S. 1970. *Die Töpfer-Twa in Ruanda*. Freiburg: Krause.

Stappers, L. 1986. *Boma: eine Sprachskizze*. Hamburg: Helmut Buske.

Swartenbroeckx, P. 1948. 'Dictionnaire kiyansi ou kiyei, langage des bayansi ou bayey de territoire de Banningville (district du Lac Léopold II) au Congo Belge lele'. Ms. Bruxelles.

Tassa Okombe-Lukumbu, G. 1994. 'Esquisse de description phonétique, phonologique et morphologique du tofoke (C53)'. Mémoire de licence spéciale, Université libre de Bruxelles, Bruxelles.

Teil-Dautrey, G. 1991. 'Évolution phonétique d'une langue bantoue du nord-ouest: le basaa A43a'. Mémoire de diplôme d'études approfondies, Université Lumière Lyon 2, Lyon.

Tete Wer Sey, I.K. 1975. 'Éléments de grammaire wóngo (wónk) C85: Phonologie et morphologie'. Mémoire de licence, Université nationale du Zaïre, Lubumbashi.

Van Den Eynde, K. 1968. '*Éléments de grammaire yaka : phonologie et morphologie flexionnelle*'. Kinshasa: Université Lovanium, Publications Universitaires.

van der Veen, L.J. 1991. 'Étude comparée des parlers du groupe okani (B30 Gabon)'. Thèse de doctorat nouveau régime, Université Lumière Lyon 2, Lyon.

Van Gheel, J. 1652. *Vocabularium Latinum, Hispanicum, e Congense. Ad Usum Missionariorû transmittendorû ad Regni Congo Missiones*. Rome: National Central Library, Fundo Minori 1896, MS Varia 274.

Vansina, J. 1995. 'New Linguistic Evidence and the Bantu Expansion'. *Journal of African History* 36: 173-195.

Wedel, A., Ussishkin, A. & King, A. 2019. 'Crosslinguistic evidence for a strong statistical universal: Phonological neutralization targets word-ends over beginnings'. *Language* 95: e428-e446.

Wiesmüller, B. 1997. 'Möglichkeiten der interdisziplinären Zusammenarbeit von Archäologie und Linguistik am Beispiel der frühen Eisenzeit in Afrika'. In R. Klein-Arendt (ed.), *Traditionelles Eisenhandwerk in Afrika: geschichtliche Rolle und wirtschaftliche Bedeutung aus multidisziplinärer Sicht*, Köln: Heinrich-Barth-Institut für Archäologie und Geschichte Afrikas, pp. 55-90.

Appendix 1: Cognate series involving Proto-Bantu *k and *g

(22) **BLR 55 **bàag* 'to tear': B41** ?, **B42** ?, **B43 –**, **B44 –**, **B501** ?, **B51Z** *bààkà* 'to defeather', **B52Z** *ù-bà:kà* 'to tear', **B53** –, **B61** –, **B62** ?, **B63Y** *gi-baha* 'to defeather, to peel', **B72a** –, **B73b** –, **B73c** –, **B73d** –, **B74** –, **B77aX** *kì-bààkà* 'to tear', **B77b** –, **B80zX** *óbàr* 'to cut in pieces, to tear', **B81** –, **B82** –, **B821** –, **B822** –, **B83** –, **B85bS** *o-baar*, **B85d** –, **B85e** ?, **B85F** –, **B861Y** *mbàʁ* 'to cut, to shave', **B862X** *bààr*, **B863** ?, **B864** ?, **B865** –, **B86P** *bà-àr* 'to pierce, to cut in pieces', **B87** –, **H111** –, **H16a** *bâkà* 'to destroy (e.g. a house), **H16b** *bààkà* 'to tear', **H16c –**, **H16g** *bààkà* 'to tear', **H31** *báákà* 'to tear'.

(23) **BLR 66 **bák* 'to build'**: **B41** ?, **B42 –**, **B43** *ìbə̂ɣə̀* 'wall', **B44** ìbáɣə̀ 'wall, enclosure, **B501** ?, **B51** ?, **B52Z** *ì-báxà* 'wall', **B53X** *báhà* 'wall', **B61Z** *lè-bá:* 'closure', **B62** ?, **B63Y** *gi-baxa* 'wall', **B72a** *è-bɔ̀ɔ́* 'wall', **B73bZ** *yé-báá* 'wall', **B73c** *íbáàá* 'wall', **B73d** *è-bàɣà*, **B74Y** *ìbɔ̀ɔ̀* 'wall', **B77aZ** *kì-bàká* 'wall', **B77bX** *ì-bóò* 'wall', **B80zX** *kɛ̀-bák* 'wall, fence', **B81** –, **B82** –, **B821** –, **B822** *è-báʁà* 'wall', **B83** –, **B85bS** *ke-bak* 'wall', **B85dZ** *ɛ́bɛɛ* 'wall', **B85e** –, **B85FX** *ɛ́-bɛ́à*, **B861** –, **B862** ?, **B863** –, **B864X** *kɛ̀-bák* 'wall', **B865** –, **B86** –, **B87** –, **H111** *kì-bákà* 'wall', **H16a** –, **H16b** –, **H16c** *báákà* 'wall', **H16g** *kì-bákà* 'wall, partition', **H31** *yì-bákà* 'wall'.

(24) **BLR 67 **bák* 'get, catch, rob'**: **B41** ?, **B42** ?, **B43** *ù-báɣúlə* 'obtain, find', **B44** *ù-báɣə̀* 'get, have, obtain', **B501** *báɣà* 'get, obtain', **B51Y** *íbáhà* 'get', **B52Z** *ù-bá:xà* 'find, receive, win', **B53X** *ù-báhà* 'obtain', **B61** –, **B62Z** *ò-báɣá* 'obtain, receive', **B63Y** *gi-baxa* 'get', **B72a** *bɔ́ɔ̀* 'obtain, find', **B73bZ** *ɔ́-báɣà*, **B73c** *bấấ* 'have, obtain', **B73d** *báɣà*, **B74Y** *ù-bɔ́ɔ̀* ~*ù-báò* 'get, obtain, grab', **B77aX** *kì-bákà* 'have', **B77bX** *ú-bóò* 'get', **B80zX** *òbák* 'obtain, touch, receive', **B81X** *òbákà* 'reach', **B82X** *kò-báʁà* 'find', **B821** *kò-báʁà* 'find', **B822** ?, **B83Z** *bɔ́ɔ̀* 'acquire, own', **B85bV** *bák* 'have', **B85d** –, **B85eW** *bâ* 'touch', **B85FX** *kábáá* 'hold, touch', **B861**–, **B862X** *bák* 'follow', **B863** ?, **B864X** *kɔ̀bák* 'caress', **B865X** *òbâ* 'get', **B86R** *àbá* 'have', **B87** –, **H111** *bàká* 'get', **H16a** *bákà* 'get, touch, understand, touch', **H16b** *bákà* 'get', **H16c** *báákà* 'take, have, get, acquire, be able to, dare to', **H16g** *bákà* 'obtain, take', **H31** *báká* 'get, take, acquire'.

(25) **BLR 70 **bàkàdà* 'man, male' ~ BLR 3732 **badaka* 'man, male': B41** *di-baɣələ*, **B42** *dí-báɣálə*, **B43** *dì-bă:lə*, **B44** *dì-báɣə̀lə*, **B501Y** *bààlà*, **B51** –, **B52Y** *bàɣàlà*, **B53X** *báhálà*, **B61** –, **B62** –, **B63Y** *balaxa*, **B72a** *ɔ̃bòl*, **B73bZ** *mɔ́-báálà*, **B73c** *Ø-báálà*, **B73d** *bàɣàlà*, **B74Y** *bɔ̀ɔlɔ̀*, **B77aX** *Ø-bàlàkà*, **B77bX** *Ø-bàlàɣà* 'man, husband', **B80z** –, **B81X** *ngóbálàkà*, **B82** –, **B821** –, **B822** –, **B83Y** *bɔ́ɔ̀*, **B85aY** *bakœl*, **B85bV** *bẹ̀à:l`*, **B85dZ** *ɛba:l*, **B85eW** *báál*, **B85F** –, **B861** –, **B862X** *bààl*, **B863Y** *bá:l*, **B864W** *bàgál*, **B864X** *ábá:l*, **B865X** *ìbàà*, **B86U** *ebaal*, **B87W** *ì-bà:l*, **H111** *bàkàlà*, **H16a** *mbàkàlà*, **H16b** *bàkàlà*, **H16c** *mbààkálà*, **H16g** *mbàkàlà*, **H31** *bì-yàkàlà* 'male genitals'.

(26) **BLR 260 **bókò* 'arm, hand, front paw' ~ 3541 **jókò* 'arm': B41** –, **B42** *ɣóóɣù*, **B43** *ɣó:ɣù*, **B44** *ɣó:ɣù*, **B501** *ɣ-óóɣò*, **B51Y** *hôhò*, **B52Z** *xôxò*, **B53X**

Ø-hòòhó, **B61** –, **B62Z** *kwɔ́yɔ́*, **B63Y** *kwoxo*, **B72b** *kwɔ̂l* (?), **B73bZ** *kɔ́ɔ́*, **B73c** *kóòó*, **B73d** *kwɔ̀ɔ́yɔ̀*, **B74Y** *kwɔ̀*, **B77aX** *kw-ókò*, **B77bX** *kuə̀-ó*, **B80zX** *lw-ɔ́k* ~ *lw-ák*, **B81X** *kɔ̀-ɔ́kò*, **B82X** *k-ɔ́ʁɔ̀*, **B821** *è-bóʁò*, **B822** *ló-òʁò*, **B83Y** *kú-ɔɔ*, **B85aX** *kw-ɔɔk* ~ *kw-ɔɔ*, **B85bV** *kw-ɛ́k*, **B85dZ** *kɔ́-ɔ*, **B85eX** *kɔ́w*, **B85FX** *kɔ́ɔ́*, **B861X** *è-wúò*, **B862X** *mə̀-lwɔ́*, **B863Y** *kó-ò*, **B864X** *kó-òk*, **B865X** *lwǒ* `, **B86P** *lw-ɔ̀ɔ̀*, **B87W** *kóò*, **H111** *k-ókò*, **H16a** *kóókò*, **H16b** *kó:kò*, **H16c** *kóókò*, **H16g** *kòòkó*, **H31** *kóókò*.

(27) **BLR 316 *bógà 'open space, threshing floor, village, path'**: **B41** ?, **B42** ?, **B43** –, **B44** –, **B501Y** *m-bòyà* 'place', **B51Y** *bòyà* 'garden, land, patch of land', **B52Z** *m-bóxà* 'at someone's home, village', **B53Y** *bòhà* 'property land', **B61Z** *lè-bó*wò 'yard, place', **B62** ?, **B63Y** *gi-buxa* 'patch of garden', *m-buxa* 'village', **B72a** *mbòò* 'place, spot', **B73bZ** *Ø-mbúwɔ̀* 'bed, place', **B73c** *lí-bűű́* 'abandoned village', **B73d** *mbùyù,* **B74Y** *ìbòù* 'place, spot', **B77aX** *mbùkà* 'place, spot', **B77bX** *mú-mvùwà* 'big village', **B80zX** *mbúkà* 'place, spot', **B81X** *mbókò* 'village', **B82X** *è-búʁó* 'village', **B821** *m-bóʁà* 'road, path', **B822** *m-bwáʁà*, **B83** –, **B85bS** *mbok* 'place', **B85d** –, **B85eX** *mbwá:* 'path, road, route', **B85FX** *mbwáá* 'path, road, route', **B861X** *mbûʁ* 'path, road, route', **B862X** *mbɔ́k* 'path, road, route', **B863** –, **B864X** *mbúk* 'village', **B865X** *mbvwâ* 'path, road, route', **B86U** *mbwóó* 'path, road, route', **B87** –, **H111** –, **H16a** *mbúkà* 'open space', **H16b** *mbúkà* 'place, bed, campsite', **H16c** *mbúúkà* 'bed', **H16g** *mbúkà* 'lodging', **H31** –.

(28) **BLR 324 *bók 'to divine, to cure (an invalid)'**: **B41** ?, **B42** *ú-bùyə̀* 'to heal, to cure', **B43** *ù-búyə̀* 'to heal, to cure', **B44** *ù-búyə̀* 'to heal, cure', **B501Y** *búyî* 'medicine man, **B51Z** *bóyà* 'to heal, to cure', **B52Z** *ù-bòx-à* 'to heal', **B53X** *ù-búhà* 'to heal', **B61** –, **B62** ?, **B63Y** *gi-buxa* 'to heal a sick person', **B72** ?, **B73b** –, **B73c** *ú-bűű́* 'to heal', **B73d** ?, **B74Y** *ùbúú.ɔ̀* 'to heal a sick person', **B77a** ?, **B77bX** *u-bua* 'to heal', **B80zX** *ò-búkùnà* 'to raise, to heal', **B81** –, **B82** ?, **B821** –, **B822** *ò-bᵊʁì* 'cure', **B83Z** *búù* 'to nurse, to be a doctor', **B85aX** *o-bɔk* 'to cure', **B85d** ?, **B85e** ?, **B85F** ?, **B861X** *mvûʁ* 'to heal', **B862** ?, **B863** ?, **B864** –, **B865** –, **B86** –, **B87W** *kábúú* 'to take care of', **H111** *bùká* 'to heal', **H16a** *wúkà* 'to heal, to dedicate, to consecrate, to bless', **H16b** *búkà* 'to practice medicine, to cure', **H16c** *búúká* 'to heal', **H16g** *búkà* 'to cure a sick person', **H31** *búká* 'to cure a sick person'.

(29) **BLR 368 *búdà 'rain'**: **B41** *mfulə*, **B42** *mvùlə̀*, **B43** *mfúlə̀*, **B44** *mvúlə̀*, **B501Y** *mvúlà*, **B51Y** *mvúlá*, **B52Y** *mvûlù*, **B53X** *Ø-mvúlà*, **B61Z** *mvúlá*, **B62Z** *mvlá*, **B63Y** *mvula*, **B72a** *mbvə̂l*, **B73bZ** *bá-mvúlɔ̀*, **B73c** *Ø-mvúlù*, **B73d** *mbvúlù*, **B74Y** *mbvúlà*, **B77aX** *mvúlà* 'rain, year', **B77bX** *Ø-mbvúlù* 'rain, year', **B80zX** *mvúlà*, **B81X** *mvúlà*, **B82Z** *mbvwê*, **B821** *mvúà*, **B822** –, **B83Y** *mvóò*, **B85aX** *mvul*, **B85dZ** *mvúl*, **B85eW** *mbúl*, **B85FX** *mvúl*, **B861** *m̀vúyè*, **B862X** *m-bvól*, **B863Y** *mvúl* 'rain, year', **B864X** *mvúl* 'rain, year', **B865X** *m-bvêl*, **B86Y** *mbvúl*, **B87T** *mbvűl*, **H111** *vúlá*, **H16a** *mvúlà*, **H16b** *Ø-mvúlà,* **H16c** *mvúúlá*, **H16g** *mvúlà*, **H31** *mbvúlà*.

(30) **BLR 429 *càkʊd 'to weed': B41** ?, **B42** ?, **B43** *ù-sǎɣùlə́*, **B44** *ù-sáɣúlə́*, **B501Y** *ù-sààlà*, **B51Z** *ì-sààlà*, **B52Z** *sàxàlà*, **B53** –, **B61Z** *ŋɔ̀-ʃálà*, **B62** ?, **B63Y** *gi-salaxa*, **B72a** *swàl*, **B73b** ?, **B73c** –, **B73d** *sàɣàlà*, **B74Y** *swɔ̀lɔ̀*, **B77aX** ?, **B77bX** *sàlàkà*, **B80zX** *ò-sákàl*, **B81** ?, **B82X** *sàʁɔ̀*, **B821** –, **B822** *nsàʁù*, **B83** ?, **B85aY** *sakœl*, **B85d** –, **B85F** –, **B85eX** *usààl*, **B861** –, **B862** –, **B863Y** *kɔ̀-sá:l*, **B864X** *kɔ̀-sá:l*, **B865X** *ɔ̀sàkùl*, **B86Y** *sààl*, **B87T** –, **H111** –, **H16a** *sàkùlà*, **H16b** *sàkùlà*, **H16c** *sààkúlà*, **H16g** *sàkùlà*, **H31** *sákwálá*.

(31) **BLR 518 *cégé 'grassland': B41** ?, **B42** ?, **B43** –, **B44** –, **B501Y** *tséɣé* 'prairie', **B51** ?, **B52** ?, **B53Y** *tʃéhɛ̀* 'plains', **B61** ?, **B62** ?, **B63Y** *li-tʃege*, **B72a** *ntsíɔ̀* 'field', **B73bZ** *Ø-nséɣè* 'field', **B73c** –, **B73d** *ntséɣɛ̀* 'field', **B74Y** *ntsjóò* '(cultivated) field', **B77a**X *ntsékɛ̀* 'field', **B77bX** *Ø-ntseɣe* 'bush, savanna, field', **B80z –**, **B81 –**, **B82** ?, **B821** –, **B822** ?, **B83 –**, **B85** –, **B85dZ** *ntsɛ:* 'field', **B85eX** *nsyé* 'savanna, bush', **B85FX** *nsíí* 'savanna', **B861** –, **B862X** *ntʃé* 'bush', **B863Y** *ntsɛ́:* 'field', **B864X** *nsék* 'field', **B864W** *ńtsèg* 'bush', **B865X** *ntsyê* 'bush', **B86Y** *ntsyéé* 'bush', **B86U** *ntsyɛ ndzuu* 'field', **B87T** *ntsíé* 'prairy', **H111** *nsékè* 'savanna fields', **H16a** *ntsékè*, **H16b** *nsékè*, **H16c** –, **H16g** *nsékè*, **H31** *tsékà* 'savanna, bush'.

(32) **BLR 521 *cégé 'horn' ~ BLR 574 *cígé 'horn': B41** *di-siɣi*, **B42** –, **B43** *dì-síɣì*, **B44** –, **B501** –, **B51** –, **B52** –, **B53** –, **B61** –, **B62** –, **B63** –, **B72** –, **B73b** –, **B73c** –, **B73d** –, **B74** –, **B77a** –, **B77b** –, **B80z** –, **B81X** *è-séké*, **B82X** *ì-séʁé*, **B821** *ì-séʁé*, **B822** *ì-séʁé*, **B83** –, **B85** –, **B85d** –, **B85e** –, **B85F** –, **B861X** *ì-sáʁ* 'elephant tusk', **B862X** *sàk*, **B863** –, **B864** –, **B865X** *ìʃík*, **B86Y** *sík*, **B87** –, **H111** *sìkí*, **H16a** –, **H16b** *síkí*, **H16c** *sìkì*, **H16g** –, **H31** –.

(33) **BLR 711 *cùk 'to wash, to cleanse' ~ BLR 712 *cùkʊd: B41** ?, **B42** *ú-tsúkə̀*, **B43** *ù-sǔɣə̀*, **B44** *ù-súɣə̀*, **B501Y** *tsòkà* 'to wash', **B51Y** *tsòkà* 'to wash', **B52Z** *ù-tsòk-à* 'to wash', **B53Y** *tsòk-à* 'to wash', **B61Z** *ŋɔ̀-swáyà*, **B62Z** *ò-tʃùk-à* 'to wash', **B62Z** *ò-swàyà* 'to wash', **B63Y** *gi-tʃwaxa* ~ *gi-tʃuka*, **B72b** *swɔ̀ɔ̀l* 'to wash', **B73bZ** *ɔ́-swááɣà* 'to wash', **B73c** *swá:* 'to wash', **B73d** *swààɣà*, **B74Y** *ùswàɔ̀* ~ *ùshwàà* 'to wash', **B77aX** *swààkà* ~ *ʃààkà*, **B77bX** *uswaɣa* 'to wash', **B80zX** *ó-swà* 'to wash, to clean', **B81** –, **B82** –, **B821** –, **B822** –, **B83Z** *swɔ̀* 'to wash things', **B85aX** *suk* 'to wash, to clean', **B85d** –, **B85e** –, **B85F** –, **B861** –, **B862** –, **B863** –, **B864** –, **B865** –, **B86** –, **B87T** *kà-sùkkè*, **H111** *sùkùlà*, **H16a** *kù-sùùkùlà*, **H16b** *sùkùlà*, **H16c** *syúúká*, **H16g** *sùkùlà*, **H31** *sùkùlà*.

(34) **BLR 761 *cúgù ~ BLR765 *cúkù 'day of 24 hours': B41** ?, **B42–**, **B43–**, **B44–**, **B501Y** *lì-tsúɣù*, **B51Y** *tsúɣù*, **B52Z** *lə̀-tsúxù*, **B53Y** *tsúhù*, **B61Z** *tʃú:*, **B62Z** *Ø-tʃùɣú*, **B63Y** *li-tcugu*, **B72a** *Ø-tsóò*, **B73bZ** *bɔ́-tsúú* 'night', **B73c** *bu-tsűű* 'night', **B73d** *tsúɣù*, **B74Y** *tsúù*, **B77aX** *bù-tsúkù* 'night', **B77bX** *tsúù*, **B80zX** *ì-tʃúk*, **B81X** *mò-súúkà* 'dawn', **B82X** *cwâ:ʁà* 'morning', **B821** *è-sû*, **B822** *bò-ʃúò* 'night', **B83Y** *Ø-tsúù*, **B85aY** *tʃuk*, **B85bS** *suk*, **B85d** –, **B85eX** *ì-tsû:* 'morning', **B85F** –, **B861** *è-ʃúù*, **B862X** *ʃú*, **B863** –, **B864** –, **B865X** *è-súù*, **B86Q** *ntsú*, **B87T** *ò-súù* 'tomorrow', **H111** *bù-súkù* 'morning', **H16a** *n'súkà* 'morning', **H16b** *ǹsúúkà* 'dawn (before 6 am)', **H16c** –, **H16g** –, **H31** *nsúúká* 'dawn, morning'.

(35) **BLR 808 *ɗàg 'to show, to teach, to command': B41** ?, **B42** –, **B43** *ndǎkə̀* 'exhibition', **B44** –, **B501Y** *làɣà* 'to teach, to show', **B51Y** *láɣà* 'to show', **B52Z** *ù-làxà* 'to show', **B53** ?, **B61Y** *ɣolaya* 'to show', **B61Z** *ŋ̀ɔ̀-lá* 'to point, to show, to teach, to ask', **B62Z** *ò-làɣà* 'to show', **B63Y** *gi-laxa* 'to show', **B72a** –, **B73b** –, **B73c** *ú-láá* 'to show', **B73d** –, **B74** –, **B77a** ?, **B77b** –, **B80z** –, **B81** –, **B82** –, **B821** –, **B822** –, **B83** –, **B85** –, **B85d** –, **B85e** ?, **B85F** –, **B861** –, **B862** –, **B863** –, **B864** –, **B865** –, **B86** –, **B87** –, **H111** –, **H16a** –, **H16b** –, **H16c** –, **H16g** –, **H31** –.

(36) **BLR 812 *ɗàgá 'promise' ~ in several WCB varieties *ɗàgí: B41** ?, **B42** *ndâɣì*, **B43** *ndǎɣì* 'promise, agreement, meeting', **B44** –, **B501** ?, **B51** ?, **B52Y** *làxà*, **B53** ?, **B61** ?, **B62** ?, **B63Y** *ndagi*, **B72** ?, **B73b** –, **B73c** ?, **B73d** ?, **B74Y** *ù-làànà*, **B77a** ?, **B77bX** *Ø-layi* 'wedding, party, rendez-vous', **B80z** –, **B81X** *kè-làká*, **B82** –, **B821** ?, **B822** ?, **B83** ?, **B85bS** *lak*, **B85bV** *lyàḱ* 'promise', **B85dZ** *élèts* 'promise', **B85eX** *ìlè*: 'promise', **B85FX** *èlàs*, **B861X** *ìlǎʁ* 'promise', **B862** ?, **B863** –, **B864X** *Ø-làts* 'promise, prophecy', **B865** ?, **B86** ?, **B87T** *ì-lèts* 'promise, rendez-vous', **H111** *làkí* 'rendez-vous, date, promise', **H16a** –, **H16b** –, **H16c** –, **H16g** –, **H31** ?.

(37) **BLR 820 *ɗáká 'tongue, language, jaw' ~ BLR 821 *ɗáká 'throat' ~ BLR 823 dáká 'affair, word': B41** –, **B42** –, **B43** –, **B44** –, **B501Y** *ndáɣá* 'voice', **B51Z** *ndáhá* 'language, voice', **B52Z** *ndáxà* 'language', **B53** –, **B61** –, **B62** ?, **B63Y** *ndaxa* 'voice', **B72a** *ndɔ́ɔ́* 'affair, thing', **B73bZ** *Ø-ndáá* 'voice, tongue, language', **B73c** *Ø-ndâá* 'voice', **B73d** *ndáɣá* 'problem, affair', **B74Y** *ndɔ́ɔ́* 'language, word, voice', **B77aZ** *n-dáká* 'affair, word', **B77bX** *Ø-ndaya* 'process, word, language', **B80zX** *n-dák* 'affair, conflict', **B81** –, **B82** –, **B821** –, **B822** –, **B83** –, **B85bV** *ndáḱ* 'voice, language', **B85dZ** *ndâ* 'language, tongue, word', **B85eW** *dâ* 'word', **B85FX** *ndáà* 'language, tongue, word', **B861** –, **B862X** *ndà* 'language, tongue, word', **B863Y** *ndâ* 'language, tongue, word', **B864X** *ndák* 'language, tongue, word', **B865X** *ndáá* 'language, word, tongue', **B86P** *dáà* 'affair, voice, news', **B87W** *ndâ* 'language, tongue, word', **H111** –, **H16a** *ndákà* 'tongue', **H16b** *ndákà* 'language, voice', **H16c** *dìlááká* 'throat', **H16g** *lù-lákà* 'tongue', **H31** *lù-lákì* 'throat'.

(38) **BLR 967 *ɗìgò 'friend, relative' ~ BLR 1175 dògó 'brother, sister (same sex), relative, friend': B41** ?, **B42** ?, **B43** *ndĭɣù*, **B44** –, **B501Y** *mùnzìɣú* 'relation', **B51** ?, **B52Z** *mù-díxà* 'friend', **B53** –, **B61Z** *ká-ndèɣì* 'friend', **B62Z** *Ø-ndíɣì* 'friendship', **B63Y** *ndigi*, **B72a** *ndòò* 'friend', **B73bZ** *i-ndúwò* 'friendship, comradeship', **B73c** *Ø-ndú:* 'friend', **B73d** *ndùɣù*, **B74Y** *ndòú*, **B77aX** *ndùkù*, **B77bX** *Ø-ndùú* 'friend', **B80z** –, **B81** –, **B82** –, **B821** ?, **B822** ?, **B83** ?, **B85bT** *nduk* 'friend, comrade', **B85d** –, **B85eW** *ù-lìy* 'brother-in-law', **B85FX** *ndúk* 'friend, comrade', **B861** –, **B862** –, **B863** –, **B864W** *ndùg* 'friend', **B865** –, **B86P** *Ø-ndýý* 'friend', **B87** –, **H111** *Ø-ndíkù*, **H16a** –, **H16b** *ndúkù*, **H16c** –, **H16g** *ndùkù*, **H31** *ndùkù*.

(39) **BLR 1006 *đíá 'water': B41** –, **B42** –, **B43** –, **B44** –, **B501** –, **B51** –, **B52** –, **B53**–, **B61Z** *njá*, **B62Z** *ndʒá*, **B63Y** *andʒa*, **B72a** *ə̃dzá*, **B73bZ** *má-dzá*, **B73c** –, **B73d** *mà-dzá*, **B74Y** *àdzá*, **B77aX**, *mà-dzá* , **B77bX** *má-dzá*, **B80z** –, **B81** –, **B82** –, **B821** –, **B822** –, **B83Y** *mádyà*, **B85bV** *nzá*, **B85dY** *mà-ndzà*, **B85eW** *à:dà*, **B85FX** *mádzà* 'water, river', **B861**–, **B862X** *ma-dzé*, **B863Y** *mánzà*, **B864X** *má-dzà*, **B865X** *àdzá*, **B86U** *màdzá*, **B87** –, **H111** *mà-zá*, **H16a** *má-ázà*, **H16b** *mázà*, **H16c** *mâ-zà*, **H16g** *màsà*, **H31** –.

(40) **BLR 1044 *đìık 'bury': B41** *ɣu-tsiiyə*, **B42** ?, **B43** *ù-tsɨ̌yə̀*, **B44** *ù-tsɨ́ɣə̀*, **B501Y** *nzèèkà*, **B51** –, **B52** –, **B53X** *ù-dììh-á*, **B61Y** *ɣo-jiɣa*, **B61Z** *ŋò-jéyà*, **B62Z** *ò-dʒììɣà*, **B63Y** *gi-dʒixa*, **B72a** *ò-dzìòl*, **B73bZ** *ɔ́-dzííyɛ̀*, **B73c** *díí*, **B73d** *dzyììyì*, **B74Y** *ùdzì. ɔ̀*, **B77aX** *dzììkà*, **B77bX** *u-dziɣa*, **B80zX** *ó-dʒìka*, **B81X** *òdììkà*, **B82** –, **B821** –, **B822** –, **B83Z** *dʒ̀ù:*, **B85aX** *o-dziuk*, **B85bS** *o-ziok*, **B85dZ** *kódzí:*, **B85eX** *ùgyè*, **B85FX** *ka-dzíí*, **B861** –, **B862X** *òdzyè*, **B863Y** *kúdzí:k*, **B864X** *kúdzí:k*, **B865X** *ò-dzyà* 'to immerse, sink, bury', **B86R** *òdzyà*, **B86Y** *dzyee*, **B87T** *ká-dzíí*, **H111** *zììkà*, **H16a** *zììkà*, **H16b** *zìkà*, **H16c** *zííkà*, **H16g** *zììkà*, **H31** *zííká*.

(41) **BLR 1100 *đòg 'to bewitch, to curse' : B41** ?, **B42** ?, **B43** *ù-lŏɣə̀*, **B44** *ù-lɔ́ɣə̀*, **B501** ?, **B51Y** *lɔ̀yò*, **B51** ?, **B52** ?, **B53X** *ù-lóhò*, **B61Z** *ŋò-ló*, **B62Z** *ò-lɔ́yɔ̀*, **B63Y** *gi-loxo*, **B72a** *lwɔ̀ɔ̀*, **B72b** *lwɔ̀ɔ̀*, **B73bZ** *ɔ́-lɔ́ɔ̀*, **B73c** *ù-lɔ́ɔ́*, **B73d** *lɔ̀yɔ̀*, **B74Y** *ùlɔ̀ɔ̀*, **B77aX** *lɔ̀kɔ̀*, **B77bX** *ú-lòyò*, **B80zX** *ó-lwàk*, **B81X** *ò-lɔ̀kɔ̀*, **B82X** *kɔ̀-lɔ̀ʁɔ̀*, **B821** *kò-lòʁò*, **B822** *ndòʁò*, **B83Z** *lò*, **B85bV** *lɔ̀k*, **B85dZ** *kɔ́lɔ:*, **B85eW** *lɔ̀w*, **B85FX** *kálɔ́ɔ́*, **B861X** –, **B862X** *lwə̀*, **B863Y** *kó-ló:*, **B864X** *kɔ-lɔ́k*, **B865X** *òlɔ̀k*, **B86Y** *lòò*, **B87** –, **H111** *lòká*, **H16a** *lókà*, **H16b** *lòkà*, **H16c** *lòókà*, **H16g** *lòkà*, **H31** *lóká*.

(42) **BLR 1104 *đògì 'witchcraft' ~ 1106 *đògò 'witchcraft'**: **B41** ?, **B42** *ndoyu*, **B43** *bù-lŏsì*, **B44** *bù-lɔ́sì*, **B501** *n-dɔ̀yɔ̀*, **B51Z** *lòyì ~ lɔ́yɔ̀*, **B52Z** *ndɔ́xò*, **B53Y** *lòhì*, **B61** ?, **B62** ?, **B63** –, **B72** –, **B73b** ?, **B73c** –, **B73d** ?, **B74Y** *ndòò*, **B77aX** *kì-lòkò*, **B77bX** *lólòyì*, **B80zX** *ìlɔ̀k*, **B81** ?, **B82** ?, **B821** *ì-lòyì*, **B822** *ì-lòʁò*, **B83** ?, **B85bS** *bɔ-lɔk*, **B85d** –, **B85eX** *ndɔ̀k*, **B85F** –, **B861X** *ì-lòʁ*, **B862** –, **B863** –, **B864** –, **B865X** *ndɔ̀k*, **B86Q** *ò-lò*, **B87T** *ɔ̀-lòts*, **H111** *bù-ndòkì*, **H16a** *mù-lòkò*, **H16b** *ǹlòkò*, **H16c** *nlòókò*, **H16g** *ǹlòkò*, **H31** *bùlókí*.

(43) **BLR 1179 *đúk 'vomit'**: **B41** *ɣu-luɣə*, **B42** *ú-lùɣə̀*, **B43** *ù-lúɣə̀*, **B44** *ù-lúɣə̀*, **B501Y** *lóyà*, **B51Y** *ílóhà*, **B52Z** *ù-lóx-à*, **B53X** *ù-lúhà*, **B61Y** *yoluɣa*, **B61Z** *ŋò-lówá*, **B62Z** *ò-lùɣá*, **B63Y** *gi-luxa*, **B72b** *lóò*, **B73bZ** *ɔ́-lúwɔ̀*, **B73c** *ú-lɪ́ɪ́ɪ́*, **B73d** *lúɣù*, **B74Y** *ùlúú.ɔ̀*, **B77aX** *lúkà*, **B77bX** *ú-lúà*, **B80zX** *ó-lúkà*, **B81X** *ò-lókà*, **B82X** *kɔ̀-lwáʁà*, **B821** *kò-lúʁà*, **B822** *ò-lwáʁà*, **B83Z** *ló*, **B85** –, **B85dZ** *kólú:*, **B85eW** *lwó*, **B85F** –, **B861X** *lúà*, **B862** –, **B863** ?, **B864** ?, **B865X** *ò-lwâ*, **B86R** *òlwá*, **B87W** *kálúú*, **H111** *lùkà*, **H16a** *kùlúkà*, **H16b** *lúkà*, **H16c** *lúúká*, **H16g** *lúkà*, **H31** *lúká*.

(44) **BLR 1180 *đòkì 'namesake': B41 ?**, **B42** *ndûɣə̀* 'name', **B43** *mù-lúɣù*, **B44** *mù-lúɣù*, **B501Y** *ndòyí*, **B51** ?, **B52Y** *Ø-ndòxá*, **B53X** *Ø-ndùhí*, **B53Y** *ndòyí*, **B61** –, **B62** ?, **B63Y** –, **B72** ?, **B73bZ** *Ø-ndùyɛ̀*, **B73c** *Ø-ndòyí*, **B73d** ?, **B74Y** *ndwèì*, **B77a** ?, **B77b** ?, **B80z** ?, **B81** –, **B82** ?, **B821** *ndòì*, **B822** ?, **B83** ?, **B85aX** *nduk*, **B85bS** *ndoy*, **B85dZ** *ndɔ́y*, **B85eW** *ndœ́y*, **B85FX** *ndøǿ*, **B861** –, **B862** ?, **B863Y**

ndɔ́y, **B864X** *ndúy*, **B865X** *ndíí*, **B86U** *ndɔ̀ɔ̀y*, **B87T** *ǹdɔ́y*, **H111** *ndóyì*, **H16a** *ndóyì*, **H16b** *ndòyì*, **H16c** –, **H16g** *ndòyì*, **H31** *ndóyí*.

(45) **BLR 1248 *đúg 'to paddle': B41** ?, **B42** ?, **B43** *ùdúɣə*, **B44** –, **B501** ?, **B51** ?, **B52Y** *dúh-ù*, **B53Y** *dúɣ-ù*, **B61** –, **B62** ?, **B63Y** *gi-djuxa*, **B72** ?, **B73b** –, **B73c** –, **B73d** ?, **B74** –, **B77a** ?, **B77bX** *u-dzua*, **B80zX** *ò-ʤúkà*, **B81X** *ò-dúkà*, **B82** ?, **B821** *kò-dvúʁà*, **B822** *ndwáʁà*, **B83Z** *dzúù*, **B85aY** *o-dzuk*, **B85d** –, **B85eX** *ùlúk*, **B85FX** *kálúk*, **B861X** *lúʁ*, **B862X** *ʤwé*, **B863** –, **B864** –, **B865X** *òdwâ*, **B86Y** *à-lúk*, **B87T** *kà-lùk*, **H111** ?, **H16a** *mvwíla*, **H16b** *vúwílà*, **H16c** ?, **H16g** *dúkà*, **H31** ?.

(46) **BLR 1274 *gàb 'divide, give away, make present': B41** ?, **B42** *ú-ɣábə*, **B43** *ù-ɣăbə* 'share', **B44** *ù-ɣăbə* 'share', **B501Y** *kàβì* 'generosity', **B51Y** *káb-ál* 'distribute, share', **B52Z** *ù-kàbà* 'share', **B53Y** *kàbà* 'distribute, share', **B61Z** *ŋò-káβà* 'share, distribute', **B62X** *ò-kàbà* 'divide', **B63Y** *gi-kabaxa* 'share', **B72a** *kàb* 'share', **B73bZ** *ɔ́-kábà* 'share', **B73c** *ú-káβà* 'share', **B73d** *kàbà* **B74Y** *ù-kàbà*, **B77aX** *kàbà*, **B77bX** *ú-kàbà* 'divide, share, offer to', **B80zX** *ó-kàb* 'share, divide in portions', **B81X** *ò-kàbà* 'divide', **B82X** *kɔ̀-kàbà* 'divide', **B821** *kò-kábò* 'divide', **B822** ?, **B83Z** *kàbò* 'divide', **B85bT** *ku-kab* 'share', **B85dZ** *kɔ́-káb* 'divide', **B85eX** *ú-káb* 'share', **B85FX** *ká-káb* 'share', **B861X** ?, **B862X** *kàb* 'share, divide', **B863Y** *kù-kàb* 'share', **B864X** *kɔ̀-kàb* 'share', **B865X** *ò-kàbùl* 'share, split', **B86Y** *kàb* 'to share', **B87W** *kà-kàb* 'share', **H111** *kàbá*, **H16a** *kábà*, **H16b** *kàbà*, **H16c** *káábà*, **H16g** *kàbà*, **H31** *káábá*.

(47) **BLR 1300 *gàdí 'oil palm, nut of oil palm' ~ BLR 3160 *jàdí 'oil': B41** *maatsi*, **B42** *má-àtsì*, **B43** *mâːtsì*, **B44** *máàtsì mà ntsábì* 'beurre de ndjawé', **B501X** *mà-àrí* 'fat', **B51X** *mààdí* 'fat', **B52Y** *mɛ̀ɛ̀dí* 'fat', **B53X** *mààdí*, **B61Z** *Ø-máːrí* 'oil', **B62Y** *mari* 'fat', **B63Y** *mari* 'fat', **B72a** *mbàál* 'fat', **B73bZ** *mɛ̀-ɛ̀rɛ* 'oil, fat', **B73c** *mà-àdì*, **B73d** *mààlá*, **B74Y** *mààlí* 'fat', **B77aX** *ma-àlí*, **B77bX** *Ø-mali*, **B80zX** *màr* 'animal fat', **B81X** *mà-àlé*, **B82X** *màːlí* 'fat', **B821** –, **B822** *mààrí* 'fat', **B83Y** *méèlè* 'fat', **B85bV** *mɛ̀ːý* 'fat, palm oil', **B85dZ** *mêts* 'palm oil', **B85eX** *mêy* 'fat', **B85FX** *mbɛ́às* 'animal fat, oil', **B861X** *ì-kăr* 'palm', **B862X** *Ø-mèy* 'fat, oil', **B863Y** *mbêts* 'palm oil', **B864X** *mâts* 'palm oil', **B865X** *mɛ̀ɛ́* 'oil, fat', **B86U** *màáy* 'fat', **B87W** *mééts* 'fat', **H111** *gásì*, **H16a** *máázì*, **H16b** *máàzì*, **H16c** *máázì*, **H16g** *mààsí*, **H31** *máásì*.

(48) **BLR 1326 *gàndó 'crocodile' ~ BLR 1446 *gòndé 'crocodile' (CL9/10): B41** ?, **B42** *Ø-ŋgândù*, **B43** *Ø-ngăndù*, **B44** *ngə̂ndù*, **B501Y** *ŋgààndú*, **B51Z** *Ø-ŋgààndú*, **B52Y** *ngààndá*, **B53X** *Ø-ngààndú*, **B61** –, **B62** ?, **B63Y** *ngandi* 'caiman, crocodile', **B72a** *ŋàán*, **B73bZ** *Ø-ngáándá*, **B73c** *Ø-ngáándú* 'caiman', **B73d** *ŋgààná*, **B74Y** *ŋàànî*, **B77aX** *ŋàànî* 'small crocodile with a pointy head', **B77bX** *ngànù*, **B80zX** *ngàn*, **B81X** *ŋɔ̀ɔ̀nó*, **B82X** *ngɔ̀ːŋɛ́*, **B821** *ŋgòné*, **B822** *Ø-ŋgònó*, **B83** ?, **B85bT** *ngwɛn*, **B85bS** *ngaan*, **B85dZ** *ngwên*, **B85eX** *ŋáán*, **B85FX** *ngwên*, **B861X** *ŋ̀kùón*, **B862X** *nkwààn*, **B863Y** *ngwên*, **B864X** *ngwɔ̂n*, **B865X** *ŋkwăn*, **B86P** *ngààn*, **B87T** *ngáàn*, **H111** *gáándù*, **H16a** *ngáándù*, **H16b** *ngándù*, **H16c** *ngáàndù*, **H16g** *ngààndú*, **H31** *ngáándù*.

(49) **BLR 1335 *gàngá 'root' ~ BLR 10077 *gangi:**[10] **B41** *mwaanzi*, **B42** *múkâŋgə́*, **B43** *dù-ngắːnzì*, **B44** *dùŋgûːnzì*, **B501X** *mú-kàŋgá*, **B51Y** *mú-kàngà*, **B52Y** *mù-kèngí*, **B53X** *mù-kéngí*, **B61Z** *ò-kàŋà*, **B62Y** *o-kaŋa*, **B63Y** *o-kaŋa*, **B72a** –, **B73b** –, **B73c** *mw-áànzì* 'root, muscle', **B73d** –, **B74** –, **B77a** –, **B77b** –, **B80z** –, **B81** –, **B82** –, **B821** –, **B822** –, **B83** –, **B85** –, **B85d** –, **B85e** –, **B85F** –, **B861** –, **B862** –, **B863Z** *nkâng*, **B864** –, **B865** –, **B86**–, **B87**–, **H111** *mwáːnsì*, **H16a** *mwáánzì*, **H16b** *mwánzì*, **H16c** *mwáánzì*, **H16g** –, **H31** –.

(50) **BLR 1355 *gègò 'molar (tooth)': B41** ?, **B42** *dí-kyékù*, **B43** *dì-kĕkù*, **B44** *dì-kékù*, **B501Y** *kèkù*, **B51Z** *kèkù* 'caries', **B52Y** *kèkà*, **B53** ?, **B61Z** *è-kéyì* 'caries', **B62** ?, **B63Y** *gi-kegi* 'prominent teeth', **B72** –, **B73b** ?, **B73c** *kékù*, **B73d** –, **B74** –, **B77a** –, **B77b** ?, **B80z** –, **B81** ?, **B82** ?, **B821** *ì-kɛ̀ʁù*, **B822** ?, **B83** ?, **B85** ?, **B85d** –, **B85e** ?, **B85F** –, **B861** –, **B862** ?, **B863** ?, **B864** ?, **B865** –, **B86** –, **B87** –, **H111** ?, **H16a** ?, **H16b** –, **H16c** –, **H16g** –, **H31** –.

(51) **BLR 1368 *gí 'egg' ~ BLR 1378 *gìdí 'egg'** ~ BLR 1385 **gìjé:* **B41** *dii-ki*, **B42** *di-ki*, **B43** *dì-kệːjì*, **B44** *dí-kì*, **B501** –, **B51** –, **B52** –, **B53X** *Ø-kí*, **B61** –, **B62** –, **B63**–, **B72a** –, **B73b** –, **B73c** *Ø-kyà*, **B73d** –, **B74** –, **B77a** –, **B77b** –, **B80zX** *íkyɛ̀l*, **B81X** *è-kèlé*, **B82Y** *ì-kìyé*, **B821** *ì-kìí*, **B822** *ì-klé*, **B83Y** *Ḱ-kɛ̀*, **B85bT** ɪkyɛ, **B85dZ** *é-kyɛ̀*, **B85eX** *à-kiè*, **B85FX** *è-kiɛ̀*, **B861X** *ì-kìí*, **B862X** *kyè~kìl*, **B863Y** *kyɛ̀*, **B864X** *lí-kɛ̀*, **B865X** *ìkyĕ*, **B86Y** *è-kyɛ̀*, **B87W** *í-kyɛ̀*, **H111** *íkì*, **H16a** *díí-kì*, **H16b** *dìì-kì*, **H16c** *díí-kì*, **H16g** –, **H31** *dí-kí*.

(52) **BLR 1389 *gì ~ BLR 1406 *gìngì 'fly': B41** ?, **B42** ?, **B43** *dù-bănzì*, **B44** *dú-ntsì*, **B501** ?, **B51** ?, **B52** –, **B53Y** *Ø-ŋgìŋgì*, **B61Z** *Ø-ŋìŋgì*, **B62** ?, **B63Y** *Ø-ngingini*, **B72a** *Ø-ŋgì ~ nzìnzì*, **B73bZ** *Ø-ŋgí*, **B73c** *Ø-ŋgí*, **B73d** *ŋgìŋgì* (borrowing), **B74Y** *ŋgìŋgì* (borrowing), **B77aX** *ŋgìŋgì* (borrowing), **B77bX** *Ø-ngigi*, **B80zX** *mùzì* 'bee', **B81** ?, **B82** –, **B821** –, **B822** –, **B83** ?, **B85** –, **B85d** –, **B85e** ?, **B85F** –, **B861** –, **B862** –, **B863** ?, **B864** –, **B865** –, **B86** –, **B87** –, **H111** *nzí*, **H16a** *nzì*, **H16b** *nzì*, **H16c** *nzíinzi*, **H16g** *nzìnzì*, **H31** *ndzíindzí là*.

(53) **BLR 1397 *gìdà 'taboo, prohibition': B41** ?, **B42** ?, **B43** *ngîlə* 'grave, cemetery', **B44** –, **B501Y** *ŋgìrí*, **B51Y** *ngìdí*, **B52Y** *ŋgìdí*, **B53Y** *ŋgìdí*, **B61** ?, **B62** ?, **B63Y** *ndziri*, **B72** *ŋgə̀l*, **B73bZ** *Ø-ngíré*, **B73c** *Ø-ngîrí*, **B73d** *ŋgìlí*, **B74Y** *ŋgìlí*, **B77aX** *ngìlí*, **B77bX** *Ø-ngili*, **B80z** –, **B81X** *Ø-ngìlé*, **B82** ?, **B821** ?, **B822** ?, **B83** ?, **B85** –, **B85d** –, **B85e** –, **B85F** –, **B861** –, **B862** –, **B863** –, **B864** –, **B865** –, **B86** –, **B87** –, **H111** –, **H16a** *mù-zìlà* 'indecent, carnal', **H16b** –, **H16c** –, **H16g** *kì-zìlà*, **H31** *yì-zílá*.

(54) **BLR 1398 *gìdá 'blood': B41** –, **B42** –, **B43** –, **B44** –, **B501Y** *mà-kìlá*, **B51Y** *má-kìlá*, **B52** –, **B53X** *mà-kílà*, **B61Z** *à-klá*, **B62** –, **B63Y** *a-kila*, **B72a** *ə̂kə̆l*, **B73bZ** *má-kílɛ̀*, **B73c** *mà-kìlí*, **B73d** *mà-kìlí*, **B74Y** *à-kìlá*, **B77aX** *mà-kìlá*,

10. We came up with an alternative reconstruction ***gangi*** for WCB (BLR 10077) because many reflexes have a final front vowel and/or umlaut of V1. Possibly both ***gàngá*** and ***gangi*** are independent derivations from ***gàng*** 'tie up' (BLR 1331).

B77bX *má-kílà*, **B80zX** *mà-kílà*, **B81X** *mà-kèlá*, **B82X** *mà-kiɛ́ː*, **B821** *mà-kìá*, **B822** *mà-klá*, **B83Y** *má-kèì*, **B85aX** *mà-kìl*, **B85dZ** *má-tsìl*, **B85eW** *á:kìl*, **B85FX** *má-tsìl*, **B861** –, **B862X** *kǎl*, **B863Z** *má-tsìl*, **B864X** *mátsìl*, **B865X** *ì-kěl*, **B86Y** *màkíl*, **B87W** *á-tsìl*, **H111** –, **H16a** –, **H16b** –, **H16c** –, **H16g** –, **H31**–.

(55) **BLR 1532 *gùbú ~ BLR 1480 *gòbú 'hippopotamus'**: **B41** ?, **B42** *ŋgûbù*, **B43** *Ø-mfʊ̂bù*, **B44** *mfúbù*, **B501Y** *Ø-mvùβú*, **B51Z** *ŋgùbú*, **B52Y** *mvùbú*, **B53X** *mvúbù*, **B61Z** *ŋgúvù*, **B62** ?, **B63Y** *ngubu*, **B72a** *mbvǎb*, **B73bZ** *Ø-mvúbɔ̀*, **B73c** *Ø-mvûβú*, **B73d** *ŋgùfú*, **B74Y** *mbvùbì*, **B77aX** *mvùbá*, **B77bX** *Ø-mvùbù*, **B80zX** *ngùb*, **B81X** *ŋgùbé*, **B82X** *ǹgvùbú*, **B821** *ŋgvùbú*, **B822** ?, **B83** ?, **B85bT** *ngub*, **B85dZ** *ńgùb*, **B85e** –, **B85FX** *ngùb*, **B861X** *ŋ̀gŭβ*, **B862X** *ngə̀b*, **B863Y** *ńgùb*, **B864X** *ńgùb*, **B865X** *ngwùú*, **B86R** *ngùú*, **B87W** *ńgùb*, **H111** , **H16a** *ngúvù*, **H16b** *mvúbù*, **H16c** *mvúùbù*, **H16g** *ngùfú*, **H31** *ngúfù*.

(56) **BLR 1607 *jògù 'elephant' ~ BLR 1571 *jàjò 'elephant'**:[11] **B41** *nzawu*, **B42** *ndzáwù*, **B43** *Ø-nzǎwù*, **B44** *Ø-nzáɣù*, **B501Y** *nzòkù*, **B51Y** *nzókù*, **B52Z** *Ø-nzòxà*, **B53Y** *nzòhà*, **B61Y** *njoɣo*, **B61Z** *à-njɔ̀ː*, **B62Y** *ndzòò*, **B63Y** *ndʒoxo*, **B72b** *ndzɔ̀ɔ̀*, **B73bZ** *Ø-nzáɣà*, **B73c** *Ø-nzyáwù*, **B73d** *ndzɔ̀ɣɔ̀*, **B74Y** *ndzɔ̀ɔ̀*, **B77aZ** *n-zòkò*, **B77bX** *nzòò*, **B80zX** *n-zɔ̀*, **B81Y** *ndzɔ̀*, **B82X** *ǹ-jɔ̀*, **B821** *ndʒòò*, **B822** *Ø-nzóò*, **B83** ?, **B85bT** *n-dzo*, **B85dZ** *Ø-nzɔ́ɔ̀*, **B85eW** *nd*ʷòw*, **B85FX** *nzɔ́ɔ́*, **B861X** *ǹdzòò*, **B862X** *ndzòò*, **B863Y** *Ø-ndzɔ́ɔ̀*, **B864X** *Ø-ndzúk*, **B865X** *ndzɔ̀ɔ̀*, **B86Y** *Ø-ndzòò*, **B87W** *Ø-nzɔ́ɔ̀*, **H111** *dzàwú*, **H16a** *nzàù*, **H16b** *nzàù*, **H16c** *nzááwù*, **H16g** *nzàwù*, **H31** *ndzyókó*.

(57) **BLR 1674 *kádí 'woman, wife'**: **B41** –, **B42** *mú-ɣàtsì* 'wife', **B43** *mù-ɣátsì* 'wife, female (of an animal), **B44** *mù-ɣàtsì* 'wife', **B501Y** *kárí* 'wife', **B51Y** *kàádì* 'wife', **B52Z** *kédì* 'wife', **B53X** *kádì* 'wife', **B61Z** *ò-kálí* 'wife', **B62X** *ó-kárí* 'wife', **B63Y** *o-kari* 'wife', **B72a** *ɔ̀̃-kál* 'woman', **B73bZ** *mɔ́-kárè* 'wife', **B73c** *mù-kádí* 'wife', **B73d** *mù-kálá*, **B74Y** *ù-kálí* 'wife', **B77aX** *mù-kálí* 'wife', **B77bX** *mú-kálì* 'wife', **B80zX** *mù-kér* 'woman, wife', **B81X** *mò-káálé* 'woman', **B82X** *mù-kálí* 'woman', **B821** *mò-kâì* 'wife', **B822** *mù-kárì*, **B83Z** *mú-kálí* 'woman', **B85bT** *mu-kyay* 'wife', **B85dZ** *mɔ́-kéts* 'wife', **B85eX** *ù-kyáy* 'wife', **B85FX** *ma-kés* 'wife', **B861X** *o-ŋkéàr* 'woman', **B862X** *ŋ̀kál* 'femme', **B863Y** *mɔ́-kéts* 'wife', **B864X** *mɔ́-káts* 'wife', **B865X** *mù-kál* 'wife, woman', **B86Y** *mù-kyáy* 'wife', **B87W** *ù-kéts* 'woman', **H111** *mù-kásí* 'wife', **H16a** *n'kázá* 'wife', **H16b** *nkází*, **H16c** *nkáází*, **H16g** *nkásà*, **H31** *n-kásì*.

(58) **BLR 1684 *kákà 'pangolin': B41** ?, **B42** ?, **B43** *dú-kàː-bǫ̂nyù*, **B44** *dù-kàɣə̀ bóɲú*, **B501Y** *Ø-káɣá* 'long tail pangolin', **B51Y** *Ø-kákà* 'long tail pangolin', **B52Y** *Ø-káɣá* 'long tail pangolin', **B53Y** *Ø-káɣá* 'long tail pangolin', **B61Z** *lè-káɣá*, **B62** ?, **B63Y** *lì-kaxa*, **B72a** *ŋkɔ́ɔ́*, **B73b** ?, **B73c** ?, **B73d** *lì-káɣá*, **B74Y** *lì-kóó*, **B77a**X *lí-kákí*, **B77b** –, **B80zX** *nkák*, **B81X** *nkákà*, **B82** ?, **B821** *nkáʁà*

11. Even though BLR 1571 is reconstructed as ***jajʊ**, reflexes such as B43 ***Ø-nzaɣu*** B73bZ ***Ø-nzáɣà*** clearly suggest that C2 must have been ****g*** or ****k***. Perhaps ***jajʊ** is a further lenition of ***jàgò**.

bòŋnó, **B822** *Ø-ŋkáʁà*, **B83** ?, **B85aY** *nkák*, **B85dZ** *nkâ ékyèl*, **B85e** –, **B85FX** *nkáá ékyèl*, **B861** –, **B862** –, **B863Y** *nkâ*, **B864X** *nkák*, **B865** –, **B86U** *nkáá*, **B87W** *nkâ íkyèlèn*, **H111** *kákà*, **H16a** *nkáákà*, **H16b** *nkákà*, **H16c** *kháákà*, **H16g** *nkákà*, **H31** *nkhákà*.

(59) **BLR 1685 *kààká ‘grandparent**, **grandfather**, **grandmother**, **older brother/sister’: B41** ?, **B42** *káàyə*, **B43** *Ø-kǎyə* ‘grandparent, owner of slaves, king, chief’, **B44** *Ø-káɣə* ‘grandparent’, **B501** ?, **B51Y** *kàɣá* ‘grandparent’, **B52Z** *ngáxà* ‘family, relative, friend’, **B53Y** *kààɣá* ‘grandparent’, **B61Z** *à-ŋkáɣá* ‘ancestor’, **B62** ?, **B63Y** *nkaxa* ‘grandfather’, **B72a** *ŋkɔ̀ɔ́*, **B73bZ** *Ø-nkáɣà* ‘grandparent’, **B73c** ?, **B73d** *ŋkààyá*, **B74Y** *ŋkàá* ‘grandparent’, **B77aX** *ŋkààká*, **B77bX** *nkàɣà* ‘grandparent’, **B80zX** *nká:k* ‘grandparent’, **B81X** *nkààká* ‘ancestor’, **B82X** *nkà:ʁá* ‘grandparent’, **B821** *Ø-nkàʁá* ‘grandparent’, **B822** *Ø-nkàʁá* ‘grandparent’, **B83** ?, **B85aY** *nkààk* ‘grandparent’, **B85dZ** *nkâ* ‘grandparent, grandchild’, **B85eW** *nkáà* ‘grandparent’, **B85FX** *nkâ* ‘grandparent’, **B861**–, **B862X** *nkàá* ‘grandparent’, **B863Y** *nkâ* ‘grandparent’, **B864X** *nkâk* ‘ancestor’, **B865X** *ŋkàá* ‘ancestor’, **B86P** *nkáá* ‘aunt’, **B87T** *nkáá* ‘grandparent’, **H111** *káákà* ‘ancestor’, **H16a** *kháákà* ‘grandparent’, **H16b** *nkáákà* ‘grandparent’, **H16c** –, **H16g** *nkààká* ‘grandparent’, **H31** *kháákà*.

(60) **BLR 1793 *kídà ‘tail’**: **B41** *mu-ɣilə*, **B42** *mú-ɣìlə*, **B43** *mù-ɣílə*, **B44** *mù-ɣílə*, **B501Y** *mú-kélà*, **B51Z** *kélà*, **B52Y** *mùkêlà*, **B53X** *mù-kílà*, **B61Z** *ò-kélà*, **B62Y** *o-kila*, **B63Y** *o-kila*, **B72a** *ɔ̀-kól*, **B73bZ** *mɔ́-kílɛ̀*, **B73c** *mú-kílí*, **B73d** *mù-kílí*, **B74Y** *ù-kílà*, **B77aX** *mù-kílà*, **B77bX** *mù-kila*, **B80zX** *mù-kílà*, **B81X** *mò-kélà*, **B82X** *mù-kɔ̂:*, **B821** *mò-kía*, **B822** *mù-klá*, **B83Z** *mú-kí*, **B85bT** *mú-kíl*, **B85dZ** *mókíl*, **B85eX** *ùkyíl*, **B85FX** *mà-kél*, **B861X** *ò-yîr*, **B862X** *ngəkyél*, **B863Y** *mùkíl*, **B864X** *mòkíl*, **B865X** *òkyá*, **B86Y** *mù-kíl*, **B87T** *ɔ̀-kíl*, **H111** *mù-kílà*, **H16a** *ǹkílà*, **H16b** *ǹkílà*, **H16c** *nkíílá*, **H16g** *ǹkíla*, **H31** *ǹkílà*.

(61) **BLR 1828 *kígè ‘eyebrow**, **eyelash**, **eyelid’ ~ BLR 1830 *kígì ‘eyebrow’ in some WCB node *kigu: B41** ?, **B42** ?, **B43** *dù-sísì* ‘eyebrow’, **B44** *dù-sísù* ‘forehead, face’, **B501Y** *kíkî* ‘eyebrow’, **B51Z** *kíkì* ‘eyebrow’, **B52Y** *kíkì* ‘eyebrow’, **B53X** *mù-kíkì* ‘eyebrow’, **B61 –**, **B62** ?, **B63Y** *o-tsigi* ‘eyebrow’, **B72a** *ɔ̃-kíò* ‘eyebrow’, **B73bZ** *mɔ́-kí* ‘eyebrow’, **B73c** –, **B73d** *mù-kyíɣí*, **B74** –, **B77aX** *mù-kíkì*, **B77bX** *mi-kiu* ‘eyebrow’, **B80zX** *lè-kìúk* ‘eyebrow’, **B81X** *kè-kíké* ‘eyebrow’, **B82X** *è-kíɣì* ‘eyebrow’,[12] **B821** *èkíɣì* ‘eyebrow’, **B822** –, **B83** ?, **B85aX** *le-kyuk* ‘eyebrow’, **B85bS** *le-kik* ‘eyebrow’, **B85d** –, **B85e** ?, **B85F** –, **B861X** *è-kɔ́ʁ* ‘eyebrow’, **B862X** *kɪ́ɪ́* ‘eyebrow’, **B863** ?, **B864X** *lɔ̀-kík* ‘eyebrow’, **B865** –, **B86P** *kîi* ‘eyebrow’, **B86P** *lù-kíí* ‘eyebrow’, **B87** –, **H111** –, **H16a** –, **H16b** *lù-kíkà ~ lusisa* ‘eyebrow’, **H16c** *tsɪ́ɪsù* ‘eyebrow, eyelid’, **H16g** *lù-kíkà*, **H31** *tsítsí* ‘eyebrow’.

12. Stappers (1986: 3) observes that in North Boma B82X, /**ʁ**/ > [**ɣ**] when followed or preceded by /**i**/. We observe the same conditioning in Mpe (B821) and Nunu (B822).

(62) **BLR 1845 *kíngó 'neck, nape, voice': B41 –, B42 –, B43** *Ø-kíːngù*, **B44 –, B501X** *lí-kìːŋgù* 'neck', **B51Y** *lí-kĭngù* 'neck', **B52Z** *Ø-kíĭngá* 'neck', **B53X** *lì-kìĭngú* 'neck', **B61Z** *Ø-ŋkúː* 'neck', **B62 –, B63Y** *ŋkii* 'neck', **B72a** *ŋkíĭ* 'neck', **B73bZ** *Ø-nkyéɛ̀ŋé* 'neck', **B73c** *Ø-kíĭngí* 'neck', **B73d** *lì-kyíɣí*, **B74Y** *nkíĭ* 'neck', **B77aX** *nkíĭ* 'neck', **B77bX** *nkiu* 'neck', **B80z –, B81X** *nkíĭ* 'neck', **B82Y** *ǹkíɔ́* 'neck', **B821** *ŋkíú* 'neck', **B822** *nkíé* **B83Y** *ŋ́-kíĭ* 'neck', **B85 –, B85d –, B85e –, B85F –, B861X** *ǹkíŋ* 'neck', **B862 –, B863 –, B864 –, B865X** *ŋ-kíŋ* 'neck', **B86 –, B87 –, H111** *nsíːngù*, **H16a** *nsíngù*, **H16b** *tsíngù*, **H16c** *tsíĭngú*, **H16g** *nsíĭngù*, **H31** *tsíĭngù*.

(63) **BLR 1904 *kókó 'chicken': B41** ?, **B42** *kòkù*, **B43** *Ø-kókù*, **B44 –, B501 –, B51 –, B52Z** *kɔ́kɔ̀*, **B53 –, B61 –, B62 –, B63 –, B72a –, B73b –, B73c –, B73d –, B74 –, B77a –, B77bX –, B80zX** *nkwɔ̀k* ~ *nkwàk*, **B81 –, B82X** *nkɔʁɔ́*, **B821** *Ø-ŋkɔ́ʁɔ́*, **B822** *ŋ-kɔ́ʁɔ́*, **B83** ?, **B85aY** *nkɔ́k*, **B85dZ** *ńkɔ́ː*, **B85eW** *nków*, **B85FX** *ńkɔ́ò*, **B85FX** *écúl á ńkɔ́ò*, **B861X** *ǹkɔ́ʁ*, **B862X** *kwɔ́*, **B863Y** *ǹkɔ́ː*, **B864X** *nkɔ́k*, **B865X** *nkwɔ́* ~ *nkwá*, **B86P** *nkɔ́ɔ́*, **B87T** ǹkòó, **H111 –, H16a –, H16b** *khúkù*, **H16c –, H16g** *kókò*, **H31** *khókò*.

(64) **BLR 2036 *kómbú** '*name*': **B41 –, B42** *kùùmbù* 'surname', **B43** *Ø-kúːmbù,* **B44** *Ø-kùːmbù,* **B501Y** *Ø-kúːmbú*, **B51Y** *Ø-kúmbú*, **B52Y** *Ø-kúːmbú*, **B53Y** *Ø-kúːmbú*, **B61Z** *ŋkwɔ́ːmí*, **B62Y** *nkuomi,* **B63Y** *li-kumu*, **B72a** *ŋkúún*, **B73bZ** *Ø-nkúúmɔ̀*, **B73c** *Ø-kúĭːmbú*, **B73d** *ŋkúúmú*, **B74Y** *ŋ-kŭĭ́*, **B77aX** *ŋ-kwúúmí*, **B77bX** *ŋ-kúmí*, **B80z –, B81 –, B82 –, B821 –, B822 –, B83Y** *ŋ́kúúmú*, **B85 –, B85dZ** *nkwúːm*, **B85e –, B85F –, B861 –, B862 –, B863 –, B864X** *nkwûm*, **B865 –, B86 –, B87T** *ǹkwôm*, **H111** *kúúmbù*, **H16a** *nkúmbù*, **H16b** *ŋkhúːmbù*, **H16c** *kúúmbù*, **H16g** *nkúúmbù*, **H31–**.

(65) **BLR 2180 *mìg 'to try': B41** ?, **B42 –, B43 –, B44 –, B501Y** *mìɣà* 'to taste', **B51Y** *méhà* 'to taste', **B52Y** *mèɣà* 'to taste', **B53Y** *u-mèɣà* 'to taste', **B61Z** *ŋò-míɣà* 'to taste, to try', **B62** ?, **B63Y** *gi-mixa* 'to taste, to try', **B72a** *ò-mbìyò*, **B73b –, B73c –, B73d –, B74Y** *ù.mjòù.ɔ̀*, **B77aX** *kì-mìkà*, **B77bX** *u-miɣa* 'to test oneself', **B80zX** *ó-mɛ̀k* 'to try, to test, to taste, to experiment, to attempt', **B81X** *ò-mèkà* 'to try', **B82X** *kɔ̀-myàʁà* 'to try', **B821** *kò-mìʁà*, **B822** ?, **B83Z** *mi̯ù*, **B85bS** *o-mek* 'to try, to taste, to attempt', **B85dZ** *kɔ̀-mɛ̀k* 'to try', **B85e –, B85F –, B861Y** *màʁ* 'to try, to taste', **B862 –, B863Y** *mɛ̀k* 'to try', **B864** ?, **B865X** *òmɛ̀k* 'to try', **B86 –, B87W** *mɛ̀k* 'to try', **H111 –, H16a** *mèkà*, **H16b** *mìkà*, **H16c** *méékáˌ* **H16g** *mìkà*, **H31** *méká* 'to try, to taste, to measure'.

(66) **BLR 2286 *nók 'rain (verb)': B41** ?, **B42** *ú-nɔ̀ɣà*, **B43** *ù-nóɣà*, **B44** *ù-nóɣà*, **B501Y** *nɔ́ɣɔ́*, **B51Y** *nɔ́hɔ̀*, **B52Z** *ù-nɔ́x-ɔ̀*, **B53X** *ù-nóhò*, **B61Z** *ŋò-nɔ́*, **B62Z** *ò-nɔ́ɣɔ́*, **B63Y** *gi-noxo*, **B72a** *endwɔ́ɔ́* 'dew', **B73bZ** *ɔ́-nɔ́ɔ̀*, **B73c** *ú-nɔ̃́ɔ̃́*, **B73d** *è-nɔ́ɔ́* 'dew', **B74Y** *ùnɔ́ɔ̀*, **B77aX** *kì-nókò*, **B77bX** *ú-nóò*, **B80zX** *ò-nwák*, **B81X** *nɔ́kɔ́*, **B82** ?, **B821** *kò-nóʁò*, **B822** *nóʁò*, **B83Z** *nɔ̃̃ɔ̀*, **B85bV** *nɔ́k*, **B85d** ?, **B85e** ?, **B85FX** *ká-nɔ́ɔ́*, **B861 –, B862X** *nwɔ́*, **B863** ?, **B864** ?, **B865X** *ò-nwô*, **B86Y** *nóó*, **B87T** *kánóó*, **H111** *nòká*, **H16a** *nókà*, **H16b** *nókà*, **H16c** *nóókáˌ* **H16g** *nókà*, **H31** *nóká*.

(67) **BLR 2368 *pàkàcà 'buffalo': B41** ?, **B42** *páɣásà*, **B43** *Ø-pǎ:sà*, **B44** *Ø-páɣəsà*, **B501Y** *pààsà*, **B51** ?, **B52Y** *pàɣàsà*, **B53** ?, **B61**–, **B62** ?, **B63** –, **B72a** *mpɔ̀ɔl*, **B73bZ** *Ø-mpáɣəsà*, **B73c** *Ø-páásà*, **B73d** *mpàhà*, **B74Y** *mpàà*, **B77aX** *mpààkà*, **B77bX** *mpàɣá*, **B80z** –, **B81** –, **B82** –, **B821** –, **B822** –, **B83Y** *m̀pɔ́ɔ̀*, **B85bV** *pẹ̀à:y`*, **B85dZ** *mpá*:s, **B85eX** *mpákása*, **B85FX** *mpákásà*, **B861X** *mpákásá* (borrowing from Kongo), **B862** ?, **B863Y** *mpá*:s, **B864** –, **B865** –, **B86U** *naa mpay*, **B87W** *mpákàs ~mpâs*, **H111** *pàkàsà*, **H16a** *mpàkàsà*, **H16b** *phákásà*, **H16c** *phàákásà*, **H16g** *mpàkàsà*, **H31** *phákásá*.

(68) **BLR 2568 *pígò 'kidney': B41** ?, **B42** *dí-pĭkù*, **B43** *mù-píɣù*, **B44** *mù-píɣù*, **B501Y** *lì-píkù*, **B51Z** *βíkù*, **B52Y** *píɣə̀*, **B53** ?, **B61** ?, **B62** ?, **B63Y** *li-pfigi*, **B72** ?, **B73bZ** *mɔ̀-mfú*, **B73c** *mú-pfĩ́*, **B73d** ?, **B74Y** *ìmpjù*, **B77a** –, **B77bX** ?, **B80z** ?, **B81X** *lè-píkè* 'liver', **B82X** *è-pyóʁù* 'liver', **B821** *è-píʁù* 'liver, lung', **B822** ? **B83** ?, **B85** –, **B85d** –, **B85e** ?, **B85FX** *fík*, **B861** *è-pɣ́ɣʁ* 'liver', **B862** ?, **B863** ?, **B864X** *lò-pík*, **B865X** *è-péké* 'liver', **B86** –, **B87** –, **H111** ?, **H16a** *mfíò*, **H16b** *mfyó*, **H16c** *lùfyó*, **H16g** *mfyò*, **H31** *m-fíkù*.

(69) **BLR 2642 *púkò 'rodent, rat, mouse': B41** ?, **B42** *pùɣù*, **B43** *Ø-púɣù*, **B44** *Ø-púɣù*, **B501Y** *púɣù*, **B51Z** *púɣù*, **B52Z** *púxù*, **B53Y** *púhù*, **B61Z** *Ø-mpóɣò*, **B62** ?, **B63Y** *pugu*, **B72b** *mpóò*, **B73bZ** *Ø-mpúúwɔ̀*, **B73c** *lì-púúsù* 'bat', **B73d** *mpúɣù*, **B74Y** *mpúù*, **B77aX** *mpúkù*, **B77bX** *Ø-mpùù*, **B80zX** *mpwɔ̀k*, **B81X** *m-pókò*, **B82X** *m̀púʁò*, **B821** ?, **B822** *m-púʁù*, **B83** ?, **B85bV** *m-pók̀* 'mole', **B85dZ** *mpû*, **B85eW** *mfùw*, **B85FX** *mpúú*, **B861X** *m̀-fúù*, **B862X** *m-pú*, **B863Y** *mpû*, **B864X** *mpúk*, **B865X** *mpúú*, **B86Y** *mpúú*, **B87W** *mpú:*, **H111** *púkù*, **H16a** *mpúkù*, **H16b** *mpúkù*, **H16c** *phúúkú*, **H16g** *mpúkù*, **H31** *phúkù*.

(70) **BLR 2741 *tákò 'buttock, rear part, back': B41** –, **B42** *dí-tăɣù*, **B43** *dì-ráɣù*, **B44** *dì-ràɣù*, **B501Y** *lì-táɣù*, **B51Y** *li-tàɣù*, **B52Y** *li-táɣà*, **B53X** *li-táhù*, **B61Y** *ɣo-tagi*,[13] **B62Y** *tayi*, **B63Y** *gi-tagi*, **B72a** *ǎ-tɔ́ɔ̀*, **B73bZ** *Ø-tàà*, **B73c** *lí-tấwù*, **B73d** *mà-táɣà*, **B74Y** *à-tóò*, **B77aX** *mà-tákì*, **B77bX** *i-tau*, **B80zZ** *kɛ̀-ták*, **B81** –, **B82** –, **B821** –, **B822** –, **B83** ?, **B85bV** *ták̀*, **B85dZ** *tâ:*, **B85e** ?, **B85FX** *é-táá*, **B861** –, **B862** –, **B863Y** *tá:*, **B864X** *ták*, **B865X** *ì-tô*, **B86R** *ètóó*, **B87** –, **H111** *tákù*, **H16a** *tákù*, **H16b** *tákù*, **H16c** *dì-táákú* 'genitals', **H16g** *tákù*, **H31** *tákù*.

(71) **BLR 2824 *téɣ 'to sell': B41** ?, **B42** ?, **B43** –, **B44** –, **B501** –, **B51** –, **B52** –, **B53** –, **B61** ?, **B62** ?, **B63** –, **B72a** *tĩɔ̀*, **B73bZ** *ɔ́-yáləɣà* (?), **B73c** *mú-téèé* 'slave', **B73d** *tyéɣè*, **B74Y** *ùtjɔ́ɔ̀*, **B77aX** *tékè*, **B77bX** *útéè*, **B80zX** *ó-tíàk*, **B80zZ** *ó-ték*, **B81X** *ò-tékɛ̀*, **B82X** *kɔ̀-téʁè*, **B821** *kò-téʁè*, **B822** *ntéʁè*, **B83Z** *tyɔ́ɔ̀*, **B85aY** *o-tiɔk ~ otiak*, **B85d** –, **B85e** –, **B85F** –, **B861** –, **B862** ?, **B863** –, **B864** –, **B865** –, **B86** –, **B87** –, **H111** *kù-tèké*, **H16a** *tékà*, **H16b** *tékà*, **H16c** *téékà*, **H16g** *tékà*, **H31** *téká*.

13. According to the data in Lane (1989), /ɣ/ is realized as [g] in front of high front vowels.

tíɔ, **B73bZ** *ɔ́-tyè*, **B73c** *téɛ́*, **B73d** *tyéyè*, **B74Y** *ùtjɔ́ɔ*, **B77aX** *tɛ́kɛ̀*, **B77bX** *u-tee*, **B80zX** *ó-tìɔ̀k*, **B81X** *ò-tɛ́kɛ̀*, **B82** ?, **B821** *kò-téʁè*, **B822** ?, **B83Z** *tìò*, **B85bS** *o-tiɔk*, **B85dZ** *kótí:*, **B85eW** *ú-téé*, **B85FX** *kátíí*, **B861** –, **B862X** *tyé*, **B863Y** *kòtí:*, **B864X** *kɔtɛ́k*, **B865** –, **B86Y** *téɛ́*, **B87W** *kà-tɛ́*, **H111** *tèkùnà* 'pour', **H16a** *tékà*, **H16b** *tékà*, **H16c** *téɛ́ká*, **H16g** *tékà*, **H31** *téká*.

(73) **BLR 2967 *tòk 'to boil up, to bubble up':** **B41** ?, **B42** ?, **B43** *ù-rǒɣə̀*, **B44** *ù-rɔ́ɣə̀*, **B501Y** *tɔ̀ɣɔ̀* 'to boil', **B51** ?, **B52Z** *ú-tɔ̀x-ɔ̀* 'to boil', **B53** ?, **B61** –, **B62** ?, **B63Y** *gi-toxo* 'to boil', **B72a** –, **B73bZ** *ɔ́-tɔ́ɔ̀sɔ̀* 'to boil for a long time', **B73c** *ú-tɔ́ɔ́* 'to boil', **B73d** ?, **B74Y** *ùtɔ́ɔ̀* 'to boil', **B77a** ?, **B77bX** *ú-tòò* 'to boil', **B80zX** *ò-tók* 'to boil, to be hot', **B81** –, **B82** ?, **B821** –, **B822** –, **B83** ?, **B85** –, **B85d** –, **B85e** –, **B85F** –, **B861X** *ǹtókísà* (borrowing from Kongo), **B862** –, **B863** ?, **B864X** *kɔ̀-tɔ̀k* 'to boil', **B865X** *ò-tɔ̀k* 'to boil', **B86** –, **B87** –, **H111** *kù-tɛ̀:ké* 'make boil', **H16a** *tòkèsà* 'make boil', **H16b** *tòkà* 'to boil, to bubble up', **H16c** –, **H16g** *tòkà* 'to boil', **H31** –.

(74) **BLR 3050 *túk 'insult':** **B41** ?, **B42** ?, **B43** –, **B44** *ù-túkə̀*, **B501** ?, **B51Y** *tù-an*, **B52** ?, **B53X** *ù-túhà*, **B61Z** *ŋò-tówá*, **B62Z** *ò-túɣá*, **B63Y** *gi-tuxa*, **B72a** *tóò*, **B73bZ** *ɔ́-túwɔ̀*, **B73c** *ú-tííí́*, **B73d** *túɣù*, **B74Y** *ùtúú.ɔ̃*, **B77aX** *túkà*, **B77bX** *ú-túà*, **B80zX** *ò-túkà*, **B81X** *òtókà* 'abuse, curse', **B82X** *kɔ̀twáʁà* 'abuse, offend', **B821** *kòtúʁà*, **B822** *tʃwáʁà*, **B83Z** *tó* 'curse', **B85bV** *tók* 'abuse', **B85dZ** *kótú:*, **B85e** –, **B85FX** *kátwáná*, **B861X** *túyè* 'abuse, offend', **B862X** *tʃwé*, **B863Y** *kòtúnú*, **B864X** *kòtúk*, **B865X** *òtwâ*, **B86Q** *òtwà*, **B87T** *kátúú*, **H111** –, **H16a** –, **H16b** *túkà*, **H16c** –, **H16g** –, **H31** *túká*.

(75) **BLR 3052 túʊk 'to come from':** **B41** *ɣu-ruuɣə* 'to come', **B42** *ú-rùúɣə̀* 'to arrive, to come from', **B43** *ù-rú:ɣə̀* 'to come', **B44** *ù-tú:ɣə̀* 'to descend, to arrive', **B501** –, **B51** –, **B52** –, **B53** –, **B61Z** *twóyà* 'to come out', **B62** ?, **B63Y** *gi-tuxa* 'to come out from', **B72a** *tɔ́*, **B73b** –, **B73c** –, **B73d** *tɔ́*, **B74Y** *twɔ́*, **B77aX** *tɔ́*, **B77bX** *u-to* 'to arrive', **B80zX** *ò-tú:kà* 'to come out, to arrive', **B81X** *ó-túókà* 'to come from', **B82X** *kɔ̀-twàːʁà* 'to come from', **B821** –, **B822** –, **B83Z** *túù* 'to come from', **B85bS** *o-twok* 'to come from', **B85dZ** *kótú*: 'to come out', **B85e** ?, **B85FX** *kátúú* 'to come out', **B861X** *tsúàʁ* 'to go', **B862X** *twə́* 'to come out', **B863** –, **B864X** *kòtúk* 'to come out', **B865X** *òtûl* 'to arrive', **B86Y** *túú* 'to come out', **B86R** *otwá* 'to come out', **B87T** *kátúú* 'to come out', **H111** –, **H16a** *túúkà*, **H16b** *túúkà* 'to arrive, to come from/out', **H16c** *túúká*, **H16g** *túúkà*, **H31** *túúká*.

(76) **BLR 3338 *jíg 'learn, imitate':** B41 ?, **B42** *ú-yìkə̀* 'to imitate', **B43** –, **B44** –, **B501** ?, **B51Y** *yéyà* 'to learn', **B52Z** *ù-yíx-à* 'to learn', **B53** ?, **B61Z** *ŋò-yéyá* 'to learn', **B62Z** *ò-jíɣá* 'to learn', **B63Y** *gi-yixa*, **B72b** *yíó* 'to learn', **B73bZ** *ɔ́-yííhɛ̀* 'to study, to learn',[14] **B73c** *ú-yíí* 'to learn', **B73d** *yíyì*, **B74Y** *ù.jíí.à* 'teach, initiate, instruct', **B77aX** *kì-yíkà* 'to teach', **B77b** –, **B80z** –, **B81** –, **B82X** *kɔ̀-zíʁà* 'to learn, to teach', **B821** –, **B822** ?, **B83** ?, **B85** –, **B85d** –, **B85e** ?, **B85F** –, **B861**

14. Bissila (1991: 54) notes that both [ɣ] and [h] only appear in between vowels. She claims they are in complementary distribution but her data does not support this claim.

–, **B862** –, **B863** ?, **B864** ?, **B865** –, **B86** –, **B87** –, **H111** ?, **H16a** –, **H16b** –, **H16c** *yìíyà* ‘to learn’, **H16g** –, **H31** –.

(77) **BLR 3350** ***jíkì* ‘bee’ ~ 1624** ***jɔki* ‘bee’: B41** ?, **B42** ?, **B43** *dì-nǐ̋kì* ‘flesh fly’, **B43** *Ø-nyósì* ‘bee’, **B44** *dí-ɲíkì* ‘flesh fly’, **B44** *nyòsì* ‘bee’, **B501Y** *ɲ-úɣì* ‘bee, honey’, **B51Y** *ɲúhì*, **B52Z** *Ø-ɲúxì*, **B53X** *ɲúɣì*, **B61Z** *Ø-ɲóyì*, **B62** ?, **B63Y** *ɲugu*, **B72a** *ndʒóò* ‘bee, honey’, **B73bZ** *Ø-ɲúsɛ̀*, **B73c** *Ø-ɲő̋sì*, **B73d** –, **B74Y** *núù* ‘bee, honey’, **B77aZ** *ɲú-kì*, **B77bX** *Ø-nugi*, **B80z –**, **B81X** *bò-ókè* ‘honey’, **B82X** *è-núɣì*, **B821** *è-ɲúɣì*, **B822** *Ø-nzúʁù*, **B83** ?, **B85aX** *niuk*, **B85bS** *nuk*, **B85dZ** *nwîts*, **B85eX** *nwî*, **B85FX** *bwíís* ‘honey’, **B861X** *è-dʒûy*, **B862X** *búy* ‘honey’, **B863Y** *ndwíts*, **B864X** *nwîts*, **B865X** *nwí*, **B86P** *nýý*, **B87W** *ndwíts* ‘honey bee’, **H111** *nyósì*, **H16a** *ɲósì*, **H16b** *nyósì*, **H16c** *nyóósí* ‘honey, bee’, **H16g** *nyùkí*, **H31** *núkì*.

(78) **BLR 3527** ***jòɡà* ‘mushroom’: B41** ?, **B42** ?, **B43** *bôːɣù*, **B44** *bóːɣù*, **B501** ?, **B51** ?, **B52Z** *bɔ̀-ɔ̀xɔ̀*, **B53Y** *ɔ̀ɔ̀kɔ́*, **B61 –**, **B62** ? **B63Y** *bwoxo*, **B72a** *bùɔ̀*, **B73bZ** *búúwɔ̀*, **B73c** *bóòó*, **B73d** *bwɔ̀ɣɔ̀*, **B74Y** *bù.ɔ̀*, **B77aX** *bwɔ̀kɔ̀*, **B77bX** *bwòòɣò*, **B80zX** *bw-àːk*, **B81** ?, **B82** ?, **B821** *mw-òʁò*, **B822** *Ø-mbòʁó* ‘savanna mushroom’, **B83** ?, **B85aX** *Ø-bwòk*, **B85dZ** *bɔ́ː*, **B85e –**, **B85FX** *bɔ́ɔ́*, **B861** –, **B862X** *bwə̀*, **B863Y** *bɔ̌kù*, **B864X** *bɔ̌k*, **B865X** *bwɔ̀*, **B86Y** *bòò*, **B87T** *bóó*, **H111** *bùwá*, **H16a** *bùwà*, **H16b** *bùwà*, **H16c** *búúkù*, **H16g** *bù-wá*, **H31** *búhwà*.

(79) **BLR 3604** ***jʊg* ‘to hear’ ~ BLR 3607** ***jʊgu* ‘to hear’**: **B41** ?, **B42** ?, **B43** *ù-ɣûːlù*, **B44** *ù-yúːlù*, **B501X** *íyòyà*, **B51X** *íyóɣà*, **B52Y** *yôxà*, **B53X** *ù-yúɣà*, **B61Y** *yo-yuɣa*, **B61Z** *ŋò-yúwá*, **B62Z** *ò-júɣá*, **B63Y** *gi-yuxa*, **B72a** *yóò*, **B73bZ** *ɔ́-yúwɔ̀*, **B73c** *ú-yűű́*, **B73d** *yúɣù*, **B74Y** *ù.júú.ɔ̀*, **B77aX** *kì-yúkà*, **B77bX** *ujwa*, **B80zX** *ózúkà*, **B81X** *òyókà*, **B82X** *kɔ̀-jwáʁà*, **B821** *kò-dʒúʁà*, **B822** *ndʒwáʁà*, **B83Z** *yúù*, **B85aX** *yuk*, **B85bR** *wok ~ wuk*, **B85bT** *kʊ-wʊ*, **B85dZ** *kɔ́-wúː*, **B85e** –, **B85FX** *kà-wáà*, **B861X** *yùʁ*, **B862X** *ò-zwé*, **B863Y** *kú-wùː*, **B864X** *kó-wùk*, **B865X** *ò-zwâ*, **B86U** *kù-wá*, **B86Y** *wɔ́ɔ́*, **B87W** *ká-wùː*, **H111** *ywá*, **H16a** *wà*, **H16b** *wà*, **H16c** *wá*, **H16g** *wá*, **H31** *kùwà*.

(80) **BLR 5467** ***kúk* ‘to cover’: B41** ?, **B42** ?, **B43** *ù-fúɣə̀*, **B44** *ù-fúɣə̀*, **B501 –**, **B51 –**, **B52 –**, **B53 –**, **B61Z** *ŋò-wúwà*, **B62** ?, **B63Y** *gi-fuxa*, **B72** *fóò*, **B73bZ** *ɔ́-fúwɔ̀*, **B73c** *úfűű́*, **B73d** *fúɣù*, **B74Y** *ù.fóú.ɔ̀*, **B77aX** *kì-fúkà*, **B77bX** *u-fuɣa*, **B80zX** *ò-fúkà*, **B81** ?, **B82X** *tʃûkɛ̀ɛ̀*, **B821** –, **B822** –, **B83Z** *fúù*, **B–85aY** *o-fuk* ‘to close, to cover’, **B85dZ** *kófúː*, **B85e** –, **B85F** –, **B861** –, **B862** ?, **B863** –, **B864X** *kò-fúk*, **B865** –, **B86P** *fwáá*, **B87T** *ká-fúú*, **H111** *kù-fúkà*, **H16a** *fúkà*, **H16b** *fúkà*, **H16c** *fúúká*, **H16g** –, **H31** *fúká*.

(81) **BLR 7089** ***dɔ̀gì* ‘sorcerer, witch’: B41** ?, **B42** ?, **B43** *mù-lő̋sì*, **B44** *mù-lósì*, **B501Y** *mù-lòɣì*, **B51Z** *mù-lòɣì*, **B52Z** *mù-lòxì*, **B53X** *mù-lòɣì*, **B61Z** *ò-lɔ̀yì*, **B62** ?, **B63** –, **B72** *ồ-lwɔ̀ɔ̀*, **B73bZ** *mɔ́-lɔ́wɛ̀*, **B73c** *mù-lòyì*, **B73d** *mù-lɔ̀ɣɔ̀*, **B74Y** *ùlòò*, **B77aX** *mù-lɔ̀kì*, **B77bX** *mù-lòɣì*, **B80zX** *mù-lwɔ̀k*, **B81** –, **B82** ?, **B821** *mò-lòɣì*, **B822** –, **B83** ?, **B85bT** *mu-lɔk*, **B85dZ** *mólèts*, **B85eX** *nà ndɔ̀k*, **B85FX** *mù-lɑ̀ɛs*, **B861X** *nkìlɔʁ*, **B862** *ŋ̀lèè*, **B863Y** *mù-léts*, **B864X** *mɔ̀-lɔ̀ts*, **B865X** *mùùr ndòk*, **B86Y** *mù-lɑ̀ey*, **B87W** *ù-lwéts*, **H111** *dòkí*, **H16a** *ndókì*, **H16b** *ndòkì*, **H16c** *ndòókì*, **H16g** *ndòkì*, **H31** *n-lókí*.

(82) **BLR 7154 *gòì 'leopard': B41** ?, **B42** ?, **B43** *já ngò* 'brother leopard (in stories)', **B44** *yá ŋgɔ̀* 'panther (in stories)', **B501** *Ø-ŋgɔ̀*, **B51** ?, **B52** ?, **B53** *Ø-ŋgòyì*, **B61Y** *ŋgɔ̀* 'panther', **B62** ?, **B63Y** *Ø-ngo* 'leopard, panther', **B72a** *Ø-ngɔ̀* 'panther', **B73bZ** *Ø-ngɔ́* 'panther', **B73c** *Ø-ngɔ́* 'panther', **B73d** ?, **B74Y** *ngwɔ̀* 'panther', **B77aX** *ngò* 'panther', **B77bX** *Ø-ngò* 'panther', **B80zX** *ngɔ̀*, **B81Y** *ngʸùè*, **B82** ?, **B821** –, **B822** *ŋ-kòì*, **B83Z** *ŋ̀gɔ́*, **B85bT** *ngɔ*, **B85dZ** *ńgò*, **B85eW** *n-gbò*, **B85FX** *ngɔ̀*, **B861** –, **B862** –, **B863Y** *ńgɔ̀* 'panther, leopard', **B864X** *ńgɔ̀*, **B865** –, **B86**–, **B87T** *ngɔ̀* 'lion', **H111** *gó* 'panther', **H16a** *ngó* 'leopard, lion', **H16b** *ngò*, **H16c** *ngô*, **H16g** *ngó*, **H31** *ngò*.

(83) **BLR 7216 *còɪk 'to hide, to cover': B41** ?, **B42** ?, **B43** *ù-swěɣə̀* 'to hide', **B44** *ù-swéːɣə̀* 'to hide', **B501Y** ?, **B51Z** *swèɛ̀ɣɛ̀* 'to cover, to bury', **B52Z** *ù-swèːxè* 'to hide', **B53X** *ù-swèhè* 'to hide', **B61** ?, **B62** ?, **B63Y** *gi-tʃwege* 'to hide', **B72** ?, **B73bZ** *ɔ́-swɛ́ɛ́ɣɛ̀* 'to hide', **B73c** *ù-swèː* 'to hide', **B73d** ?, **B74Y** *ù.ʃɪ.ɔ̀* 'to hide', **B77aX** *kì-ʃwèèkɛ̀* 'to hide', **B77bX** *ú-swèèɣè* 'to hide', **B80z** –, **B81** –, **B82** ?, **B821** ?, **B822** ?, **B83** ?, **B85** –, **B85d** –, **B85e** –, **B85F** –, **B861** –, **B862** –, **B863Y** *swěk* 'hide', **B864** –, **B865** –, **B86** –, **B87** –, **H111** *kù-swèèkɛ́* 'to hide', **H16a** *swéká* 'to hide', **H16b** *swèkà* 'to hide', **H16c** *swèékà* 'to hide', **H16g** *swèèkà* 'to hide', **H31** *swéékɔ́* 'to hide'.

(84) **BLR 9599 *pàká 'difficulty, contestation' ~ BLR 10130 *paki**: 'pain, suffering, difficulty': **B41** ?, **B42** ?, **B43** *Ø-pǎɣə̀* 'objection, opposition, difficulty', **B44** *Ø-páɣə̀* 'doubt', **B501** ?, **B51** ?, **B52** ?, **B53X** *mù-páhà* 'doubt', **B61** –, **B62** ?, **B63Y** *paxa* 'expensive, difficult', **B72** ?, **B73bZ** *Ø-mpáɣà* 'doubt', **B73c** *páàá* 'doubt', **B73d** ?, **B74** –, **B77a** ?, **B77bX** *mpàà* 'disorder', **B80z** –, **B81** –, **B82** ?, **B821** –, **B822** ?, **B83** *m-pásì* 'suffering', **B85bS** *mpeay* 'difficulty', **B85dZ** *mpès* 'difficulty', **B85e** ?, **B85FX** *mpéàs* 'difficult', **B861** *m̀pâɣ* 'pain', **B862** ?, **B863** ?, **B864X** *mpás* 'difficult', **B865X** *mpâs* 'pain, difficulty, anger', **B86P** *mpày*, **B87** –, **H111** *mpásì* 'difficult', **H16a** *mpákà* 'dispute, conflict', **H16b** *mpásì* 'difficulty', **H16c** *pháásí* 'pain, suffering, difficulty, accident, adversity', **H16g** *mpàká* 'conflict, fight', **H31** *pháásí* 'suffering'.

(85) **BLR *coko/*cogo 'liver': B41** ?, **B42** –, **B43** –, **B44** –, **B501** –, **B51** –, **B52** –, **B53** –, **B61Y** *lesoɣo* 'liver', **B62Y** *lesɔɔ* 'liver', **B62Z** *lè-sɔ́ɣɔ́* 'liver', **B63Y** *li-soho* 'liver', **B72a** *ntsɔ̀* 'lung', **B73b** –, **B73c** *Ø-tsɔ́ɔ́ ɲúúngù* 'pancreas', **B73d** ?, **B74Y** *lì-ntsɔ̀ɔ́-fúlì* 'lung', **B74Y** *lì-ntsɔ̀ɔ́* 'liver', **B77a** ?, **B77b** –, **B80z** –, **B81** –, **B82** –, **B821** *è-sóò* 'kidney', **B822** –, **B83Z** *lí-ntsɔ̀ɔ̀* 'liver', **B85aX** *sòk* 'liver', **B85dZ** *lɔ́-sɔ̀*: 'liver', **B85e** –, **B85FX** *é-sɔ̀ɔ̀* 'liver', **B861** –, **B862** –, **B863Y** *sò*: 'liver', **B864X** *sòk* 'liver', **B865** –, **B86** –, **B87T** *là-sòò* 'liver', **H111** ?, **H16a** *lù-sòkò* 'liver', **H16b** *nsòkò* 'liver', **H16c** –, **H16g** *n-sókò* 'liver', **H31** –.[15]

15. Probably by metonymical extension, words referring to an internal organ can be extended to refer to other internal organs, cf. 'liver' meanings vs. 'lung' and 'pancreas'. The same happens with BLR 2568 ***pígò*** 'kidney'. Within WCB, the reflexes of ***pígò*** mean 'liver' instead of 'kidney'.

(86) **BLR *bagu 'fire': B41** ?, **B42** *Ø-mbawu*, **B43** –, **B44** *Ø-mbá:tsù*, **B501X** *Ø-mbá:hù*, **B51X** *mbáhù* 'fire, warm weather', **B52Y** *Ø-mbùaxà* 'fire', **B53X** *mbààhú* 'fire', **B61Z** *ò-bá:* 'fever', **B62Y** *mbaa* 'fire', **B63Y** *ba*, **B72a** *bàà* 'fire', **B73bZ** *Ø-bááyà* 'fever', **B73c** *libáá* 'fever', *Ø-mbáá* 'fire', **B74Y** *mbàà* 'fire, warm (weather)', **B77aX** *Ø-mbà:* 'fire, warm', **B77bX** *Ø-mbàà* fire, **B80zX** *mbàà* 'warm (weather) ', **B81X** *mbàà* 'fire', **B82X** *m̀bà:* 'fire', **B821** –, **B822** *mbò*, **B83Y** *ḿbáà*, **B85bT** *mbyaak* 'fire', **B85bZ** *mbá*: 'fire', **B85dZ** *mbá*: 'fire', **B85eW** *ḿbá*: 'fire', **B85FX** *mbá*: 'fire', **B861** –, **B862X** *mbòò* 'fire', **B863Y** *mbá*: 'fire', **B864X** *mbá*: 'fire, warm weather', **B865** –, **B86U** *mbàà* 'fire', **B87W** *mbá*: 'fire', **H111** *mbá:wù* 'hot weather', **H16a** *mbáázù* 'fire, hot weather', **H16b** *mbáázù*, **H16c** *mbáázù* 'fire, heat', **H16g** *mbááwù* 'warmth, fire', **H31** *mbááwú*.

(87) **BLR *kag 'bite'**: **B41** ?, **B42** *ú-kàɣə*, **B43** *ù-ɣǎkə*, **B44** *ù-ɣákə*, **B501Y** *ík̩hà*, **B51Z** *íkáyà*, **B52Z** *ù-kàx-à*, **B53X** *káh-á* 'to bite, to sting', **B61** –, **B62** ?, **B63Y** *gi-kaha*, **B72** ?, **B73b** –, **B73c** *ù-kákà* 'to tear', **B73d** ?, **B74** ?, **B77a** –, **B77bX** *u-kaɣa* 'to be torn', **B80z** –, **B81** –, **B82** –, **B821** *mìŋkàʁú* 'jaw', **B822** ?, **B83** –, **B85** –, **B85d** –, **B85e** –, **B85F** –, **B861X** *ì-kǎʁ* 'tooth', **B862** –, **B863** –, **B864** –, **B865** –, **B86** –, **B87** –, **H111** ?, **H16a** –, **H16b** –, **H16c** –, **H16g** –, **H31** –.

(88) **BLR *coko/*cogo 'cassava': B41** ?, **B42** ?, **B43**–, **B44**–, **B501** –, **B51** –, **B52** –, **B53** –, **B61** –, **B62** –, **B63** –, **B72a** *è-sùɔ́* 'cassava', **B73b** –, **B73c**–, **B73d** *lì-sɔ̀ɣɔ́*, **B74Y** *ì-sɔ̀ɔ́*, **B77aX** *lì-sòkó* 'cassava tuber', **B77bX** *ń-sòó* 'cassava bread', **B80z** –, **B81** –, **B82** ?, **B821** –, **B822** ?, **B83** –, **B85aY** *nsɔk* 'cassava tuber', **B85d** –, **B85eX** *ntsɔ̀* 'manioc', **B85FX** *nsɔ̀ɔ̀* 'cassava', **B861** –, **B862** –, **B863** –, **B864X** *lɔ̀-sɔ́k* 'cassava', **B865X** *ntswɔ̀ɔ́* 'cassava', **B86P** *sɔ́ɔ́* 'chikwangue, cassava tuber, cassava', **B87T** *ntsô* 'cassava', **H111** –, **H16a** –, **H16b** *nsòkò* 'yam sp.', **H16c** –, **H16g** –, **H31** –.

Appendix 2: Language varieties and sources in this study

	Language variety	WCB subbranch	Source
1	Shira **B41**	KLC extended_KLC_North-West	(ALGAB)[16]
2	Sangu **B42**	KLC extended_KLC_North-West	(Idiata-Mayombo 1993)
3	Punu **B43**	KLC extended_KLC_North-West	(Blanchon 2008; Mavoungou & Plumel 2010)
4	Lumbu **B44**	KLC extended_KLC_North-West	(Mavoungou & Plumel 2010)
5	Wanzi (Mayela) **B501Y**	Kasai-Ngounie_Nzebi-Teke West	(Hombert & Mouélé 1988; Mouélé 1997)
6	Duma (Bembikani) **B51Y**	Kasai-Ngounie_Nzebi-Teke West	(Mickala-Manfoumbi 1988)
	Duma (Bembikani/Lastoursville) **B51Z**	Kasai-Ngounie_Nzebi-Teke West	(Mouélé 1997)
7	Nzebi (Mbigou) **B52Y**	Kasai-Ngounie_Nzebi-Teke West	(Mouélé 1997)
	Nzebi (Lébamba) **B52Z**	Kasai-Ngounie_Nzebi-Teke West	(Marchal-Nasse 1989)
8	Tsaangi (Madouma) **B53X**	Kasai-Ngounie_Nzebi-Teke West	(Loubelo 1987)
	Tsaangi (Lekoko) **B53Y**	Kasai-Ngounie_Nzebi-Teke West	(Mouélé 1997)
9	Mbete (Ndjounou) **B61Y** [Congo]	Kasai-Ngounie_ Mbete	(Lane 1989)
	Mbete (‘Obaa’, Tsaama I) **B61Z** [Congo]	Kasai-Ngounie_ Mbete	(Ndouli 2001)
10	Mbaama (Okondja) **B62Z** [Gabon]	Kasai-Ngounie_ Mbete	(Okoudowa 2016)
	Mbaama (Sibiti) **B62Y** [Congo]	Kasai-Ngounie_ Mbete	(Lane 1989)

16. ALGAB stands for the *Atlas Linguistique du GABon* project supervised by Prof. Lolke Van der Veen at Université Lumière Lyon 2 (cf. http://www.ddl.ish-lyon.cnrs.fr/equipes/index.asp?Langue=FR&Equipe=8&Page=Action&ActionNum=48). Basic vocabulary collected for this language atlas was also used in recent phylogenetic studies (cf. de Schryver *et al.* 2015; Grollemund *et al.* 2015; Pacchiarotti *et al.* 2019).

11	Nduumo (‘Kuya’) **B63Y**	Kasai-Ngounie_ Mbete	(Biton 1969)
12	Ngungwel (Gamboma) **B72a**	Kasai-Ngounie	(Rurangwa 1982)
	Ngungwel (‘Mpumpu’) **B72b**	Kasai-Ngounie	(Raharimanantsoa 2016)
13	Laali (Mayeye) **B73bZ**	Kasai-Ngounie_Nzebi-Teke West	(Bissila 1991)
14	Yaa (Bihoua) **B73c**	Kasai-Ngounie_Nzebi-Teke West	(Mouandza 2001)
15	Tyee (Kingoué) **B73d**		(Ruth Raharimanantsoa p.c.)
16	Eboo-Nzikou **B74Y**	Kasai-Ngounie	(Raharimanantsoa 2012a; Raharimanantsoa 2012b; Raharimanantsoa 2017; pers. comm.)
17	Kukwa (West Plateau) **B77aX**	Kasai-Ngounie	(Paulian 1975)
	Kukwa **B77aZ**	Kasai-Ngounie	(Daeleman’s archive)[17]
18	Fumu (Ngamaba) **B77bX**	Kasai-Ngounie	(Makouta-Mboukou 1969; Makouta-Mboukou 1976)
19	Boma Yumu (Pentane/Mondai) **B80zX**	Kasai-Ngounie_KwaKasai North	(Burssens 1999)
	Boma Yumu (Ito) **B80zZ**	Kasai-Ngounie_KwaKasai North	(Burssens 1999)
20	Tiene (‘Dya’, Mansele) **B81X**	Kasai-Ngounie_KwaKasai North	(Ellington 1977; Bastin *et al.* 1999)[18]
	Tiene (‘Nkɛtɛ’) **B81Y**	Kasai-Ngounie_KwaKasai North	(Mangulu 2004)

17. The reference (Daeleman’s archive) stands for the legacy of Jan Daeleman’s research data that was entrusted to Ghent University in 2018. Jan Daeleman was a Jesuit father who spent most of his life in the DRC and collected data on multiple Bantu languages spoken there.
18. The basic vocabulary which (Bastin *et al.* 1999) used for their lexicostatistical study is currently available on the website of the Royal Museum for Central Africa in Tervuren: https://www.africamuseum.be/nl/research/discover/human_sciences/culture_society/lexicostatisticstudybantulanguages.

21	North Boma (Mushie) **B82X**	Kasai-Ngounie_KwaKasai North	(Stappers 1986)
	North Boma (Mpukumbu) **B82Z**	Kasai-Ngounie_KwaKasai North	(Bastin *et al.* 1999)
22	Mpe (Bolebe) **B821**	Kasai-Ngounie_KwaKasai North	own fieldwork
23	Nunu (Mushie) **B822**	Kasai-Ngounie_KwaKasai North	own fieldwork
24	Mfinu (Yuo) **B83Y**	Kasai-Ngounie extended	(Bastin *et al.* 1999; Daeleman's archive)
	Mfinu **B83Z**	Kasai-Ngounie extended	(Daeleman's archive)
25	West Yans (Mukonkie) **B85aX**	Kwilu-Ngounie	(Swartenbroeckx 1948)
	West Yans (Makwa) **B85aY**	Kwilu-Ngounie	(Mayanga 1985)
	East Yans **B85bR**	Kwilu-Ngounie	(Swartenbroeckx 1948)
	East Yans (Nkara/Niadi) **B85bS**	Kwilu-Ngounie	(Nguma 1986)
	East Yans (Nkara) **B85bT**	Kwilu-Ngounie	(Impubi Mukwa 1987), (Koni Muluwa & Bostoen 2015)
	East Yans (Mantshiene) **B85bV**	Kwilu-Ngounie	(Rottland 1977)
26	East Nsong ('Luniungu', Kipuka) **B85dZ**	KLC extended	(Koni Muluwa 2010; Koni Muluwa & Bostoen 2015)
27	Mpur (Kwebe) **B85eX**	Loange-Atlantic_ Kamtsha-Kwilu	(Koni Muluwa & Bostoen 2015)
	Mpur (Due I) **B85eW**	Loange-Atlantic_ Kamtsha-Kwilu	(Kibwenge India'Ane 1985)
28	Nsambaan (Kwilumpia/Longo K.K. **B85FX**	Loange-Atlantic_Kamtsha-Kwilu	(Koni Muluwa 2015b)
29	East Ngwi (Mangai) **B861X**	WCB	own fieldwork

30	East Lwel (Sedzo) **B862X**	WCB	(Khang Levy 1979; Koni Muluwa & Bostoen 2015)
31	Mpiin (Kipuka) **B863Y**	KLC extended	(Koni Muluwa 2010; Koni Muluwa & Bostoen 2015)
32	Ngong (Kwenge) **B864X**	KLC extended	(Koni Muluwa 2010; Koni Muluwa 2015a; Koni Muluwa & Bostoen 2015)
	Ngong (Lukula) **B864W**	KLC extended	(Pokoso 1986)
33	Nzadi (Indolo) **B865X**	WCB	(Crane *et al.* 2011; Koni Muluwa & Bostoen 2015)
34	West Ding (Mateko) **B86P**	WCB	(Mwan Mesongolo 1984)
	East Ding (Ipamu) **B86Q**	WCB	(Kitoko Mufanga 1978; Munkyen Okab 1990)
	East Ding (Bantshione) **B86R**	WCB	(Mula 1977)
	East Ding (‘Mbentsie’, Bambudi) **B86U**	WCB	(Koni Muluwa & Bostoen 2015)
	West Ding (Sedzo) **B86Y**	WCB	(Ebalantshim Masuwan 1980)
35	Mbuun (Idiofa) **B87T**	KLC extended	(Dibata Mimpiya 1977; Mundeke 1979; Mundeke 2011)
	West Mbuun (Imbongo) **B87W**	KLC extended	(Koni Muluwa 2010; Koni Muluwa 2014; Koni Muluwa & Bostoen 2015)
36	Sikongo **H16a**	KLC extended_ KLC_South	(Van Gheel 1652; Kongo-King fieldwork; Narciso Cobe 2010)
37	Hangala **H111**	KLC extended_KLC_North	(Nkouanda 1997; Mabiala 1999)

38	Yombe **H16c**	KLC extended_KLC_South-West	(De Grauwe 2009)
39	Ntandu **H16g**	KLC extended_KLC_East	(Daeleman 1983; Daeleman s.d.; Daeleman's archive)
40	Manyanga **H16b**	KLC extended_KLC_Central	(Laman 1912; Laman & Meinhof 192-829; Laman 1936)
41	Yaka **H31**	KLC extended_KLC_Kongoid	(Van Den Eynde 1968; Ruttenberg 2000)

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Résumé

Dans cet article, nous évaluons, par la méthode comparative, la validité généalogique du bantu de la côte occidentale (WCB, West-Coastal Bantu) en tant que sous-groupe principal de la famille bantu. Tout en nous basant sur 66 séries de cognats, nous démontrons que les langues classifiées comme WCB selon les méthodes quantitatives lexicales partagent au moins une innovation phonologique : la fusion des occlusives vélaires ***g*** et ***k*** du proto-bantu, suite au dévoisement du ***g*** qui se produit lorsque celui-ci n'est pas précédé d'une nasale. Nous montrons que la fusion des occlusives vélaires est une innovation phonologique tout à fait unique distinguant le WCB des autres groupes phylogénétiques bantu tels que celui du sud-ouest et celui de l'est. Il sépare probablement aussi le WCB des langues bantu du nord-ouest et du centre-ouest, où le ***g*** s'est dévoisé, mais pas toujours avant que ***k*** ne soit réduit à zéro. Cependant, à ce stade, les preuves empiriques manquent, et spécialement les recherches historico-comparatives systématiques, pour nous permettre de poursuivre la vérification de cette hypothèse. Quoi qu'il en soit, tout en nous fondant sur Möhlig (1981), nous conjecturons que le dévoisement récurrent de ***g*** que l'on retrouve dans plusieurs langues bantu ancestrales de la forêt équatoriale pourrait signaler un substrat pré-bantu de chasseurs-cueilleurs.